

The Iron Age

INDEX TO
READING MATTER
PAGE 32.

A Review of the Hardware, Iron and Metal Trades.

INDEX TO
ADVERTISEMENTS
PAGE 19.

Published every Thursday Morning by DAVID WILLIAMS, No. 83 Reade Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XXXV: No. 3.

New York, Thursday, January 15, 1885

\$4.50 a Year, Including Postage.
Single Copies, Ten Cents.

Improved Hot-Blast Oven for the Shelby Iron Company, Alabama.*

BY J. A. M'ARTHUR.

Realizing the community of interest we have in everything relating to the manufacture of charcoal iron, and the circumstance of being in "convention assembled" for the purpose of discussions for mutual instruction, I am encouraged to present for consideration the plans and drawings of a new iron hot-blast oven recently built for our Furnace No. 1, at Shelby Iron Works, Alabama. It consists, as exhibited by the drawings, of six double-flued bed-pipes, each 12 x 22 inches. On each bed-pipe are 14 webbed syphons, of 3 1/2 x 8 inches cross-section, having an aggregate radiating surface of 622 superficial feet. The oven is divided into three sections, either one of which can be switched out at any time for repairs. By a system of valves, as shown in the drawing, the blast can pass through each oven chamber, consisting of 28 syphons, with a radiating surface of 1243 square feet, direct to hot-blast pipe, or through each section consecutively, giving a radiating surface in the aggregate of 3729 square feet in all the chambers. The gases are discharged from the main gas flue through inlets regulated by valves to each combustion chamber, of which there are two to each section of the oven, passing then through eyelets to the chambers above. Air is admitted to the combustion chambers through branched flues from the rear end in the dead wall dividing the combustion chambers, and on which the bed-pipes rest. By a combination of doors easy access is obtained to every part of the interior of the oven for cleaning, repairs, &c. There is no draft chimney, but at the two ends of each chamber, at the top of the crown, are short iron flues 2 feet high and 8 inches in diameter. The whole crown of the chambers is also perforated with holes 2 x 4 inches—for illustration, like a pepper-box cover. The internal dimensions of the various parts are as follows, in square inches:

Area of cold-air pipe.....	254
Area of each cold-air nozzle.....	143
Combined area of cold-air nozzles.....	528
Area of each syphon.....	32
Combined area of 14 syphons.....	448
Area of main hot-blast pipe.....	233
Area of each hot-blast nozzle.....	142
Combined area of six hot-blast nozzles.....	852
Area of main gas-pipe.....	572
Area of each gas nozzle.....	354
Combined area of nine gas nozzles.....	3,186
Area of bed-pipe.....	260
Combined area of six bed-pipes.....	1,560
Area of each valve.....	354
Area of all syphons—84 combined.....	1,848
Area of each cold-air inlet to gas chambers.....	36
Combined area of six cold-air inlets to gas chambers.....	216
Area of each cold-air inlet to gas chambers.....	156

After an experience of many years, and the trial of several well-known patterns, we consider this the best form of hot oven we have ever used for its radiating power for heating blast, for its more perfect combustion of gas, for its better facilities for controlling and distributing the flow of both hot and cold air and of the gases for the purpose of combustion. In submitting this paper, I will add that, if my experience can suggest anything that may be of service to any charcoal ironworkers, they are welcome to it, and, at the same time, I desire to avail myself of the experience and practical suggestions of others. There was used in the construction of our new hot-blast oven for our Furnace No. 1:

Bed brick.....	M.	97,276
Fire brick.....	M.	29,518
Hydraulic lime.....	bbis.	22
Common lime.....	bbis.	86
6 double-flued bed-pipes, each weighing 8,740 lbs.....	lbs.	52,440
84 syphons, each weighing 1,730 lbs.....	lbs.	144,480
108 sleeves, each weighing 80 lbs.....	lbs.	8,640
6 3-inch bridge-rods, each weighing 308 lbs.....	lbs.	1,848
21 rings and keys, aggregating.....	lbs.	180
1 flange.....	lbs.	75
6 large doors and frames, aggregating.....	lbs.	2,000
12 smaller doors and frames, aggregating.....	lbs.	1,900
12 smallest size doors and frames, aggregating.....	lbs.	502
33 plates for bottom and top, aggregating.....	lbs.	6,342
4 buck staves, aggregating.....	lbs.	2,500
24 flanges, aggregating.....	lbs.	1,900
Girders and binders, aggregating.....	lbs.	11,600
12 butterfly-valves, aggregating.....	lbs.	4,440
Wrought-iron ties, aggregating.....	lbs.	1,250

Together with the cold-air wrought pipes, unlined, and the hot-air and gas pipes, lined, as shown on plan. The lining of hot-air and gas pipes are not included in above estimates of brick.

METALLURGICAL NOTES.

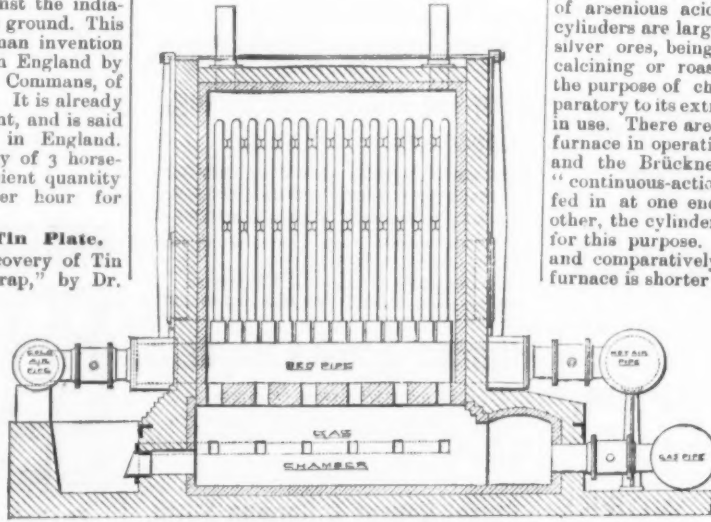
Machine for Mixing Molding Sand.

We find in an English exchange the following account of a machine for mixing and grinding molding sand for foundry purposes: "A vertical shaft which is mounted within the frame of the machine carries at its upper end a horizontal disk in which are bolted a number of upright pins arranged in five concentric rows. The upper ends of these pins pass only just clear of the top plate of the mixer, in which is a central opening to receive the mouth of a hopper into which the sand is fed. Around the edge of this top plate, and secured by an iron band, is a rubber apron, which hangs down below the top of the frame to

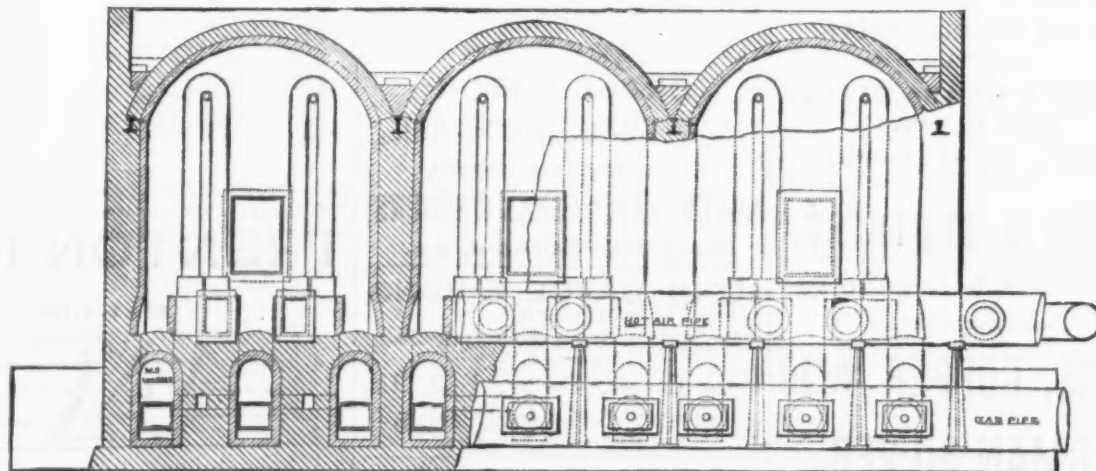
which the upper plate above mentioned is secured by bolts. In using the machine, the sand is fed in through a hopper upon the mixing plate, which is kept revolving at a high rate of speed, being driven by a pulley on the lower end of the shaft. The centrifugal action throws the sand violently against the series of concentric pins, and thoroughly breaks it up and mixes it before it escapes over the edge of the machine, where it strikes against the india-rubber apron and falls to the ground. This sand mixer, which is a German invention (Schutze's patent), is made in England by Messrs. T. B. Jordan, Son & Co., of 52 Gracechurch street, E. C. It is already largely in use of the Continent, and is said to be rapidly finding favor in England. When driven with an energy of 3 horsepower it will supply a sufficient quantity of thoroughly-mixed sand per hour for about 40 molders."

Separating Tin from Tin Plate.
In an article "On the Recovery of Tin and Iron from Tin Plate Scrap," by Dr.

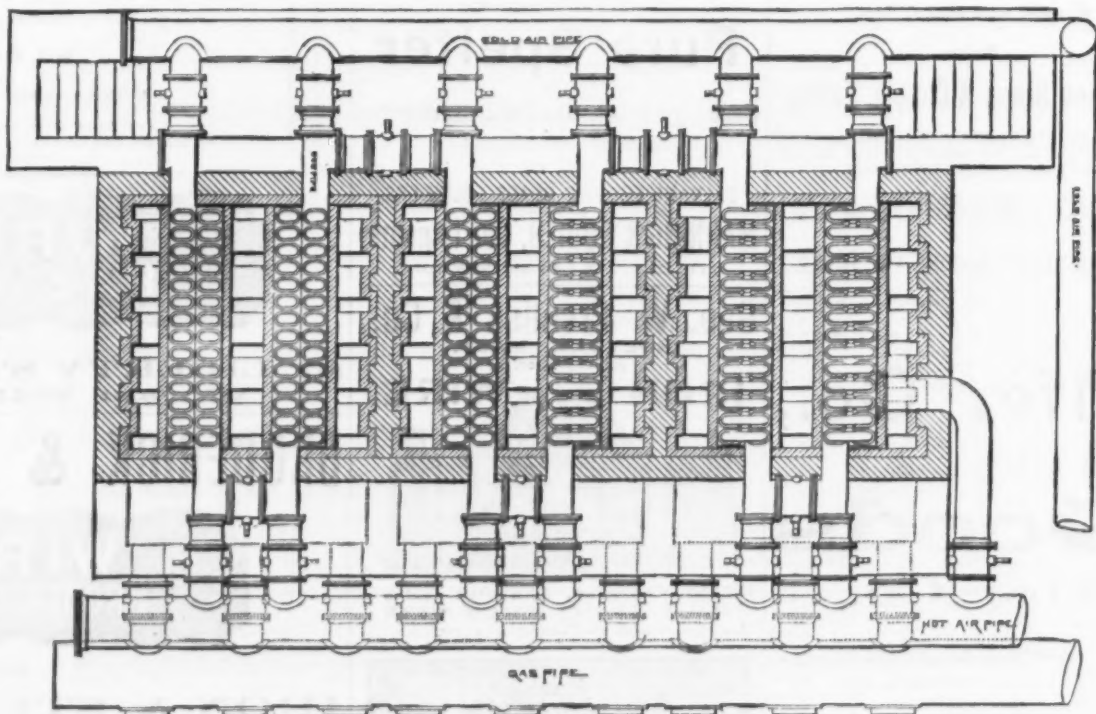
ing agent is present. According to this process, the scrap is cut up into small fragments, treated in revolving drums with caustic soda for the removal of grease, and thence transferred to other drums, to be acted upon by a solution of oxide of lead in caustic soda. The reaction which occurs may be expressed by the equation: $\text{Sn} + 2\text{NaOH} + 2\text{PbO} = \text{Na}_2\text{SnO}_3 + 2\text{Pb} + \text{H}_2\text{O}$,



Cross-Section of Oven.



Longitudinal Section through Oven.



Sectional Plan of Oven.

IMPROVED HOT-BLAST OVEN, BUILT FOR THE SHELBY IRON COMPANY, ALABAMA.

Osminatis, the author says it is not possible to obtain a complete separation of the iron and tin by proceeding according to the various methods which depend upon bringing the scrap to the melting point of tin, which is then removed in the molten state by mechanical means, such as revolving the scrap in a drum with sand, or by use of a centrifugal machine. The iron which is left contains so much tin as to be of little value for working up in the furnace. The salts of tin obtained by treating the scrap with acid solvents are also too much contaminated with iron to render an acid-extraction process advisable. Better results, however, should be obtained with Reinecker's process, which depends upon the power which caustic alkali has of dissolving tin when an oxidiz-

ing agent is present. According to this process, the scrap is cut up into small fragments, treated in revolving drums with caustic soda for the removal of grease, and thence transferred to other drums, to be acted upon by a solution of oxide of lead in caustic soda. The reaction which occurs may be expressed by the equation: $\text{Sn} + 2\text{NaOH} + 2\text{PbO} = \text{Na}_2\text{SnO}_3 + 2\text{Pb} + \text{H}_2\text{O}$,

An Improved Calcining Furnace.

We reprint from London Engineering the following account of an improvement in revolving calcining furnaces:

Furnaces in the form of revolving cylinders are widely known and considerably used in this country, notably in the case of "black-ash" furnaces in alkali works; also as re-

volving puddling furnaces, and the Siemens revolving "direct-process" furnaces for producing iron. As calciners, revolving cylinders have not found much use, the branches of metallurgy to which they are particularly adapted not being much practiced here, though in the form of the Oxland and Hocking furnaces they have been recommended and employed for the calcination of arsenical pyrites for the production of arsenious acid. In America revolving cylinders are largely used in the working of silver ores, being found very effective for calcining or roasting the ore with salt, for the purpose of chloridizing the silver preparatory to its extraction by various processes in use. There are three well-known forms of furnace in operation, the Howell, the White, and the Brückner. The two former are "continuous-action" furnaces, the ore being fed in at one end and passing out at the other, the cylinder being set at an inclination for this purpose. They are long furnaces, and comparatively narrow. The Brückner furnace is shorter and wider, and is not con-

the calcination in the cylinder being carried on by the waste heat passing off from the reverberatory furnace. A furnace of this description would not be suitable for treating many lead ores, which would get pasty and semi-fused at the hotter part of the cylinder, and cause much trouble and imperfect work. But the cylinder furnace has recently been taken up and adapted to lead smelting in a very ingenious manner by Mr. T. C. Huntington, manager of the large works of Messrs. G. Henfry & Co., near Spezia, in Italy. These works are almost the largest of their kind in Europe, and are most excellently equipped in all respects for working lead-silver ores. The method of smelting is mainly that of calcination and agglomeration, followed by reduction in blast furnaces. Mr. Huntington, though finding advantages in the use of the revolving cylinder, found it better to have cylinder and agglomerating furnace quite separate.

It was also found that with the cylinder fired at one end, as usual, satisfactory results were not obtained, as with many ores the temperature necessary to carry on active oxidation at the flue end was sufficient to clot and sinter the ore at the fire end, preventing further efficient calcination and clogging the cylinder. After some experiments the arrangement finally adopted by Mr. Huntington is as follows: The cylinders, some 15 feet long by a little under 5 feet wide, revolving in the ordinary manner on rollers, are placed horizontally, and are fired by producer gas. At each end is an inlet for gas and for hot air, it being so arranged by means of reversing-valves that the direction of the flame may be changed as desired, as in the ordinary regenerative furnaces. The charge of ore is fed into the cylinder from a hopper placed over it, and its calcination is watched through openings left for the purpose in the ends. When it is found that the ore is so hot at the fire end of the cylinder that sintering might commence, the gas and air are reversed, and so the greatest heat removed to the cooler end, till that in turn becomes hot enough to require reversing to take place. In this manner it has been found possible to carry on the oxidation of lead ore rich in silica, and particularly liable to clotting, without any difficulty, and to a degree of perfection not obtained in any of the ordinary forms of calcining furnaces. When a charge is finished it is discharged through doors in the sides of the cylinder, as is done in the Brückner furnace, into a hopper wagon placed below, the wagon being then raised by hydraulic lift to the top of the agglomerating furnace. This latter works continuously at a sufficiently high temperature to at once liquefy the ore which comes to it thoroughly oxidized from the cylinders. Sulphate of lead, formed during calcination, is decomposed by the well-known action of the silica, the final product obtained being a slag almost completely free from sulphur and in excellent condition for the following treatment in the blast furnace. The cylinders and agglomerating furnaces are placed close together, the waste heat from the latter being utilized in heating the air for the cylinders by means of a "recuperator," built in a chamber at the flue end of the furnace, the air on its way to the cylinders passing through pipes or channels in brickwork, which are heated from outside by the furnace gases passing away to the main flue, as in the recuperator of the Ponsard furnaces. This supply of hot air to the cylinders very much diminishes the quantity of gas required for heating them, and materially assists calcination.

Plant and Processes.

A riveting machine which presses together the plates to be joined during the process of forming the rivet head has been patented by J. F. Allen, of Brooklyn, N. Y. The stationary die in the end stake or anvil-post is surrounded by a sleeve which has a screw-thread on the exterior to engage a nut that turns in the end stake. By revolving the nut the sleeve is moved toward the inner side of the plates to be joined. The forward motion of the ram and its dies against the head of the rivet will now produce the desired pressure against the plates. The machine is so arranged that the further motion of the ram causes the nut to turn and the sleeve to recede slowly. By varying, therefore, the resistance of the nut the pressure of the plates may be increased or diminished. The sleeve may be attached to a piston working in a cylinder that surrounds the stationary end die, and hydraulic pressure employed to force the piston and sleeve outward.

S. Pedder, of Pittsburgh, Pa., has patented a mold for casting ingots formed of several layers of metal. The mold is formed of two halves, each constituting one side and one end. By putting the halves in position and locking them in place a square receptacle is formed between them. The object of this peculiar construction is to enable the size of the mold to be altered by simply shifting the sections. Within the mold is placed the center-plate of the ingot, resting upon small blocks at the bottom and dividing the mold into two narrow chambers. At the top the center-plate is held in place by means of a band clasp extending transversely over the mold top. Metal is poured into the mold and will inclose the center-plate at the sides and also on the top and bottom. If desired, the ingot may be made with two or more center-plates.

*Presented at the fifth annual meeting of the United States Association of Charcoal Iron Workers, St. Louis, Mo., October 4, 1884. From the Journal of the United States Association of Charcoal Iron Workers.

ANSONIA BRASS AND COPPER CO.,
MANUFACTURERS OF
PURE COPPER WIRE,
For Electrical Purposes,
Bare and Covered.
O'NEIL'S PATENT PLANISHED
COPPER.
Seamless Brass and
Copper Tubing,
Sheets, Bolts, Rods,
Wire, O'Neil's
Patent Nickel-
Plated Copper,
&c.,
—IN—

W. E. DODGE,
Pres't.
G. P. COWLES,
V.-P. and Treas.
A. A. COWLES,
Secretary.

Ansonia Refined Ingot
Copper, Anchor Brand;
LAKE INGOT COPPER.

19 & 21 CHM Street,
NEW YORK.

PHELPS, DODGE & CO.,
IMPORTERS OF
TIN PLATE,
ROOFING PLATE,
Sheet Iron Copper, Pig Tin, Wire,
Zinc, &c.
MANUFACTURERS OF
COPPER AND BRASS.
CLIFF STREET, NEW YORK.

SCOVILL MFG CO
BRASS,
MINGS WIRE, GERMAN SILVER.
PHOTOGRAPHIC GOODS.
BUTTONS,
CLOTH AND METAL.
DEPOTS
419 & 421 Broome St., N. Y.
177 Devonshire St., Boston.
83 Lake St., Chicago.
FACTORIES,
Waterbury, Conn.
New Haven, Conn.
New York City.

DICKERSON, VAN DUSEN & CO.,
Importers of
Tin Plate, Pig Tin, Sheet Iron, Copper,
Wire, Zinc, Etc.
39 & 51 CHM St., cor. Fulton,
DICKERSON & CO., Liverpool. **NEW YORK.**

**THE NEW HAVEN
COPPER CO.,**
SOLE MAKERS OF
POLISHED COPPER
Under Patent of T. James, Sept. 12, 1876.
ALSO MANUFACTURERS AND
DEALERS IN
BRAZERS & SHEATHING COPPER,
Kettles, Bottoms, Bolts, Circles, &c.
290 Pearl Street - **NEW YORK.**

ESTABLISHED 1837.
INCORPORATED 1876.

Waterbury Mfg. Co.,
WATERBURY, CONN.,
Brass Goods
Iowa Barb Wire Co.,

98 READE STREET, EASTON, 89 LAKE STREET,
New York. Pennsylvania. Chicago, Ill.



MANUFACTURERS OF BARB WIRE.

THE WIRE GOODS CO.,
Worcester, Mass.

Bright Wire Goods, Mill Wire Goods, Belt Hooks, Double-Pointed Tacks and Staples, Wire
Picture Cord, Clothes Line Wire, Hand Rail Screws, &c., &c. Wires cut, bent, milled, straightened
and made to any desired shape. Orders solicited from the Trade for the full line of Screw
Eyes, &c., known as Hardware Wire Goods. Quality guaranteed the best in the market.
Special articles made to order.

A. W. FARMELEE, Pres't.

THE WIRE GOODS CO., Worcester, Mass.



Waterbury Brass Co.

ESTABLISHED 1845.

Sheet, Roll and Platers' Brass,
GERMAN SILVER,
Copper, Brass and German Silver Wire
BRASS AND COPPER TUBING,
COPPER RIVETS AND BURS,
BRASS KETTLES,
Door Rail, Brass Tags,
PERCUSSION CAPS,
POWDER FLASKS,
Metallic Eyelets, Shot Pouches, Tape Measures, &c.
And small Brass Wares of every Description.
Cartridge Metal in Sheets or Shells a Specialty.
Sole Agents for the

Capwell Mfg. Co.'s Line of Sport-
ing Goods.

DEPOTS, Hills At
296 Broadway, New York. WATERBURY,
125 Eddy St., Providence, R. I. Conn.

POPE, COLE & Co.
BALTIMORE
COPPER WORKS,

No. 57 South Gay St., BALTIMORE, MD.,
Have always on hand and for sale
INGOT COPPER,
also Cakes, of unequalled purity and toughness.

ROME IRON WORKS,
Manufacturers of
Brass, Gilding Metal, Cop-
per and German Silver
(In Sheets, Rods, Tubing or Wire),
COPPER & BRASS RIVETS
AND BURS.
Rome, New York.

BROWN & BROTHERS,
81 Chambers St., N. Y. Waterbury, Conn.

**BRASS, COPPER AND
GERMAN SILVER**

In Sheets, Rolls, Rods, Wire, Tubing,
Rivets, and Burs, Etc.

ALSO,

Seamless Brass & Copper Tubing.
PATENTED SEAMLESS BRASS AND COPPER
HOUSE BOILERS, warranted to stand 300 lbs.
pressure and guaranteed against vacuum.
PATENTED SPRING TEMPERED SHANK,
SILVER-PLATED, FLAT TABLE WARE, in rich
designs.
GERMAN SILVER SPOONS AND FORKS.

H. S. CHASE,
Sec'y & Treas.

**The Plume & Atwood
Mfg. Company,**

MANUFACTURERS OF

SHEET and ROLL BRASS and WIRE,
German Silver and Gilding Metal,
Copper Rivets and Burs,
Copper Electrical Wire, Pins,
Brass Butt Hinges,
Jack Chain,
Kerosene Burners,
Lamp Trimmings, &c.

18 Murray Street, New York.
71 Pearl Street, Boston.
115 Lake St., Chicago.

Rolling Mill, Factories,
THOMASTON, Ct. WATERBURY, Ct.

Bridgeport Brass Co.,

MANUFACTURERS OF

Sheet and Roll Brass,
Brass & Copper Wire & Tubing.
Seamless and Brazed Tubing,
Copper and Iron Rivets.

OILERS and CUSPADORES, LAMPS and TRIMMINGS,
LANTERNS and TRIMMINGS, KEROSENE BURNERS,
Clocks & Fly Fan Movements, PLUMBERS' MATERIALS.

Particular attention paid to cutting out Blanks
and manufacturing Metal Goods.

MANUFACTORY, WAREHOUSE,
Bridgeport, Conn. 19 Murray St., N. Y.

Holmes, Booth & Haydens,

WATERBURY, CONN.

NEW YORK, BOSTON,
25 Park Place, 15 Federal St.
22 Murray St.

Manufacturers of all kinds of

Brass, Copper & German Silver,
ROLLED AND IN SHEETS.

BRASS & COPPER WIRE,
Tubing, Copper Rivets & Burs.

BRASS & IRON
JACK CHAIN, DOOR RAIL,
German Silver Spoons,

SILVER PLATED FORKS & SPOONS,
Kerosene Burners, &c.

JOHN DAVOL & SONS,
Agents for

Brooklyn Brass & Copper Co.,
Dealers in
Ingot Copper, Spelter, Lead, Tin,
Antimony, Solder & Old Metals,
100 John Street, New York.

PASSAIC ZINC CO.

MANUFACTURERS OF

Pure Spelter

FOR
Cartridge Brass, Gas Fixtures, Bronzes
AND ALL FINE WORK.

Also for

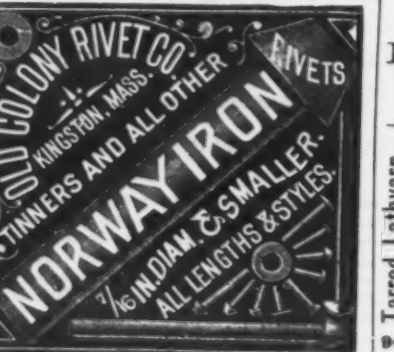
GALVANIZERS AND BRASS FOUNDERS.
MANNING & SQUIER, Gen'l Agents,
111 LIBERTY ST. (2d Floor), NEW YORK.

Geo. W. Prentiss & Co.,
HOLYOKE MASS.,
Manufacturers of

IRON WIRE.



Bright, Coppered, Annealed and Tin
Plated. Also GUN SCREW WIRE
of all sizes straightened and cut to order.



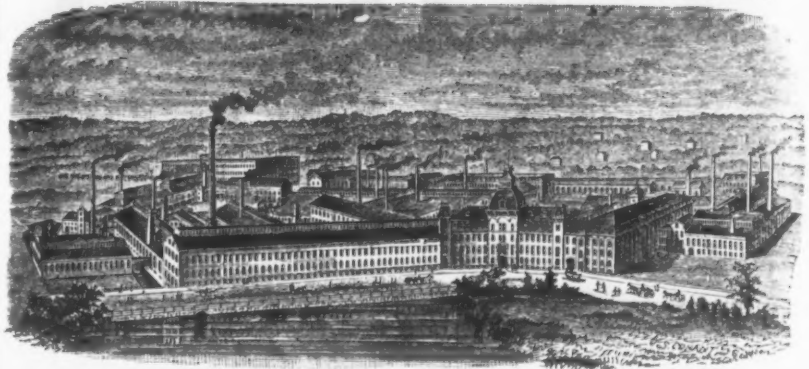
E. JENCKES MANFG. CO.,

PAWTUCKET, R. I.,

Bright Wire Goods, Belt Hooks,
SPRING PINS, KEYS AND COTTERS.
Bent Wire Goods of all kinds a Specialty.

New York Office, 88 Chambers Street,
SAMUEL A. HAINES, Selling Agent.

PHILIP L. MOEN, President and Treasurer. CHAS. F. WASHBURN, Vice President & Secretary.
WASHBURN & MOEN MANUFACTURING CO.,
Established 1831. WORCESTER, MASS.



MANUFACTURERS OF
IRON and STEEL WIRE,

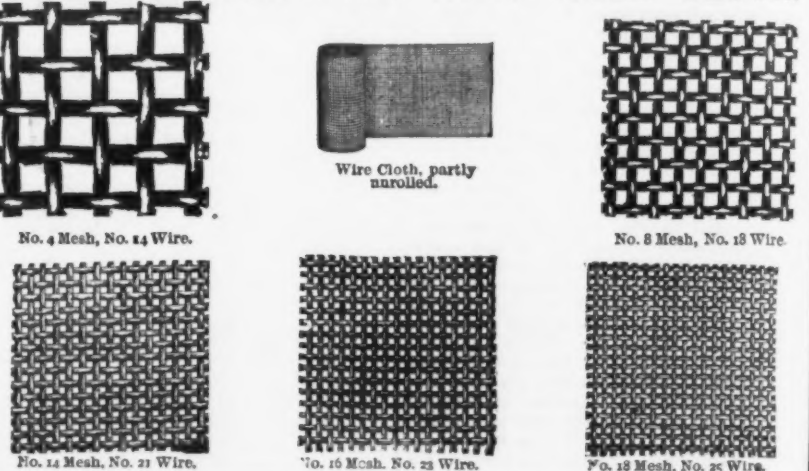
Patent Steel Barb Fencing, Patent Steel Wire Bale Ties.

WIRE RODS of all Grades: Round Iron, Rivet quality, 3-18 in. to 4 in., cut to any length. Owners and ex-
clusive Operators of the **PATENT CONTINUOUS ROLLING MILL**, producing Iron and Steel WIRE, in
coils of 100 pounds, without seam or weld. Patent Galvanized Telegraph Wire, Market and Stone Wire,
Annealed Fence and Grape Wire in long lengths: Coppered Fall-Rail Wire: Rope, Bridge, Bolt, Screw, Rivet, Buckle
and Chain Wire. Wire for the manufacture of Card Clothing, Heddies, Reeds, &c. Piano-string Covering Wire,
Tinned Broom Wire and Tinned-plated Wire of all sizes. A specialty is made of Clock, Machinery, Gun Screw and
Spiral Spring Wire, and Refined Wire to Pattern for particular purposes, from selected stamps of Norway Iron.
Any grade of Wire furnished, Annealed, Bright, Polished, Coppered, Galvanized or Tin Plated. Wire furnished,
Straightened and Cut to any length. Steel Oringline Wire, Patent Linen Finish. Unriveted Steel Music
Wire. Steel Wire for Springs, Needles and Drills. Market Steel Wire kept in stock, all sizes.

WAREHOUSES: New York, 16 CHM, and 341 Pearl St.
Chicago, 107 and 109 Lake St.

HOWARD & MORSE,
Warehouse, 45 Fulton Street, New York,
MANUFACTURERS OF

BRASS COPPER AND IRON WIRE CLOTH.



ABRAM S. HEWITT, President. THE JAMES HALL, Treasurer.
WM. HEWITT, Vice-President. E. HANSON, Secretary.

TRENTON IRON COMPANY.

(INCORPORATED 1847.)

MAKERS OF IRON AND STEEL



OF ALL GRADES.
Bright, Annealed, Coppered, Tinned and Galvanized

Iron and Steel Wire Rods. Extra Qualities of Bar Iron and Rods.
Best Qualities of Gun-Screw and Charcoal Iron Wire; Crucible, Siemens-Martin and
Bessemer Steel Wire.

WIRE STRAIGHTENED AND CUT TO LENGTHS.
WORKS AND OFFICE, TRENTON, NEW JERSEY.

NEW YORK OFFICE: COOPER, HEWITT & CO., 17 Burling Slip. PHILADELPHIA OFFICE: JOHN HEWITT, Agent, 21 North Fourth St.
CHICAGO OFFICE: 170 Dearborn Street.

WIRE ROPE
HAZARD MFG CO

WAREHOUSES:
87 LIBERTY STREET, NEW YORK.
WORKS: WILKESBARRE, PA.

BRODERICK & BASCOM ROPE CO.,

WIRE ROPE
BRODERICK & BASCOM ROPE CO.

MANUFACTURERS OF

IRON & STEEL WIRE ROPE.

728 N. Main St. St. Louis Mo.

A. LESCHEN & SONS,
Manufacturers of

WIRE ROPE
Tarpaulin, Manila Rope, Hemp Packing Twines.

903 & 905 N Main St., ST. LOUIS, MO. Correspondence invited

W. S. ESTEY,
MANUFACTURER OF

WIRE CLOTHS
OF BRASS, COPPER,
IRON, GALVANIZED AND
STEEL WIRE, OF ALL
MESSES AND GRADES

Iron and Steel Locomotive Spark Wire Cloth. Heddies for Export and Foundry use. Coal
and Sand Screens. Iron Bailing Cloths. Wire Work of every description.
NO. 86 FULTON ST., NEW YORK.

O. LINDEMANN & CO.,
Manufacturers of
Japanned, Brass,
Tin Plater
and Wood



BIRD CAGES
Original inventors
and patentees of
bright Metal Cages
constructed without
solder.

254 Pearl St.
NEW YORK.

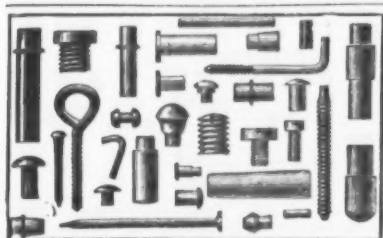
CARY & MOEN,
Manufacturers of
STEEL WIRE for all purposes and **STEEL SPRINGS** of every description.



Market Steel Wire, Crinoline Wire, tempered and covered.
Also Patent Tempered Steel Furniture Springs, constantly on hand.

934, 936 and 938 West 29th Street,
NEW YORK.

FRED. J. MEYERS MFG. CO.,
COVINGTON, Ky., Manufacturers of
WIRE GOODS OF ALL KINDS,
Wrought-iron Fencing, Cresting and Hardware Specialties.
Send for Illustrated Catalogue and Price List.

IRON AND BRASS RIVETS,
Studs, Pins, Screws, &c.,
For Manufacturers of Light Hardware.
BLAKE & JOHNSON, Waterbury, Conn.

CLEVELAND WIRE WORKS
U.S. Tyler
MANUFACTURER OF
Revolving Coal Screens,
Coal Yard Screens and
Foundry Riddles.
Wire Cloth of Every Description Made and
Carried in Stock.
CLEVELAND, - - - OHIO.

FOR PRICES ON
CORN POPPERS, SIEVES,
WIRE CLOTH, &c.,
Scrub, Shoe, Whitewash and Other Brushes

THE BROMWELL BRUSH
& WIRE GOODS CO.,
CINCINNATI.
Established 1819.

DEWITT WIRE CLOTH CO.
87 Chambers St., NEW YORK,
708 Market St., PHILADELPHIA,
MANUFACTURERS

Brass and Copper Wire,
WIRE CLOTH
of every description.
Double Selvage, Painted Wire Window Cloth.
WIRE NETTING FOR FENCING,
POULTRY YARDS, &c.,
Wire Rope for Mines, Elevators, Cables and
Transmission of Power,
WIRE CORDS FOR PICTURES WINDOW SASHES, &c., &c.

PATENT OFFICE.
F. V. BRIESEN,
82 and 84 Nassau Street,
NEW YORK.

AMERICAN AND FOREIGN
PATENTS
Solicited promptly and at the lowest rates.

WILLIAM MANN, JR., & CO.
LEWISTOWN, PA.,
MANUFACTURERS OF
RED WARRIOR
AXES, BROAD AXES,
Adzes, Broad Hatchets,
SPANISH AXES AND TOOLS.

Harrow Discs of superior finish.
Spring Harrow Teeth of every de-
scription. Pointed Harrow Teeth,
round, square, diamond or oval.
Gautier Steel Department
of Cambria Iron Co.,
Johnstown, Pa.

New York Office: 104 READE ST.
Chicago Office: 100 DEARBORN ST.
Philadelphia Office: 523 ARCH ST.

[No. 94.]

CHARLES A. OTIS, President. SAM'L ANDREWS, Vice President. SAM'L A. BAGUE, General Manager.
THOS. JOPLING, Treasurer. JOHN C. ANDREWS, Secretary.

THE AMERICAN WIRE COMPANY,
DRAWERS OF
IRON AND STEEL WIRE OF EVERY
DESCRIPTION

TELEGRAPH AND TELEPHONE WIRE.
GALVANIZED, TINNED AND COPPERED WIRE.
WIRE STRAIGHTENED AND CUT TO LENGTHS.
EASTERN OFFICE, Room 24, Astor House Offices, New York.
K. C. PALMER, Agent.
CLEVELAND, OHIO.
WESTERN OFFICE, Room 24, Commercial Nat'l. Bank Building, Chicago.
BEN. PATTERSON, Agent.

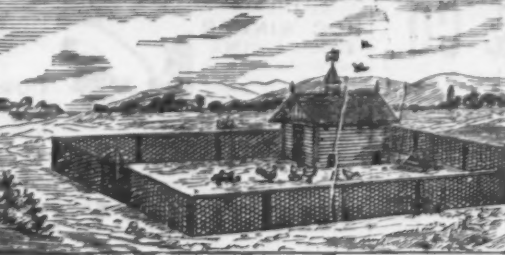
J. A. EMERICK **HOWARD EVANS**
MANUFACTURERS
MOLDERS' TOOLS,
FOUNDRY FACING,
MOLDING SAND,
FOUNDRIY SUPPLIES,
J. A. EMERICK & CO.,
1056 to 1076 Beach St. PHILADELPHIA.



TO MEET THE DEMAND for good and
cheap Railings, we offer this **Composite Iron**
Railings at \$1.50 per lineal foot, 3 ft. 6 in. high.
The Chilled Iron Ornament is poured on to the
Wrought Iron Rods, welding the panel into one piece
without joints, rust cannot enter. The posts and braces
have large iron flange at base. You can set this fence
into ground yourself. Stone foundations are not neces-
sary, so that the \$1.50 per lineal foot covers the whole
expense. Composite Iron Works Co. 83 Reade St. N. Y.



ESTAB'D 1818. INCORP'D 1874.
Gilbert & Bennett Mfg. Co.
42 CLIFF ST., NEW YORK,
MANUFACTURERS OF
Iron & Galvanized Wire
Sieves and Wire Cloth.
Power Loom Painted and Galvan-
ized Window Screen Wire Cloth.
Galvanized Wire Cloth for Drying
Fruits, Ward's Galvanized Web
Wire Fence, Galvanized Twist
Wire Poultry Netting.
Factories, Georgetown, Conn.



ESTABLISHED 1848. INCORPORATED 1870.
WM CABLE EXCELSIOR WIRE MFG. CO.,
43 FULTON STREET, NEW YORK
MANUFACTURERS OF ALL KINDS OF
Brass, Copper and Iron Wire Cloth,
AND BRASS AND COPPER WIRE,
Coal and Sand Screens, Riddles, &c.

MIL TEMPERED
MORGAN SPRING CO.
WORCESTER, MASS.




LUDLOW-SAYLOR WIRE CO.,
ST. LOUIS, MO.

WIRE, WIRE CLOTH, WIRE ROPE,
Counter Railings, Window Guards, Iron and Wire Fences,
PLAIN AND BARBED FENCING WIRE.




National Wire & Iron Co.
Detroit, MANUFACTURERS OF Mich.
Iron Stairs, Iron Shutters, Roof Cresting, Weather Vanes, Wire Scales
Illuminated Sidewalk Tile, Wire Counter Railings, Wire Cloth, Chemo-Bates
Wire & Iron Fences, Stable Fixtures, Casting Brushes, Counter Supports,
Sand & Coal Screens, &c.
Send for Catalogue. Mention this Paper.



THOMPSON McCOSH, President. JOHN A. McCOSH, Sec. and Treas.
BARB WIRE **LIFTER AND CARRIER.**
NO DANGER OF CUT-
TING HANDS OR TEAR-
ING CLOTHES.
SAVES THE PRICE OF
THE LIFTER MANY
TIMES EVERY DAY.
Manufactured
Solely by
Hawkeye Steel Barb Fence Co., Burlington, Iowa.
Our Agents, John H. Graham & Co., 113 Chambers St. carry stock of our Lifters and will supply at Factory prices.



The above cut represents Preston's Patent Braided Cable Wire Fence Rail, manufactured by the
HOLLOW CABLE MFG. CO., Hornellsville, N. Y. We also manufacture extensively
four different sizes Wire Clothes Lines. Send for Circulars and Price Lists.
Chamberlain & Miller, Western Agents, 89 Lake St., Chicago, Ill.



THORN WIRE HEDGE CO.,
CHICAGO, ILL.,
SOLE MANUFACTURERS OF
KELLY STEEL BARB WIRE,
AND WHOLESALE DEALERS IN
"S and C" and Red Star Barb Wires,
Staples, Gates, &c.
Write for Catalogue and Special Prices.




NEW HAVEN NUT CO.,
MANUFACTURERS OF
HOT-PRESSED NUTS AND WASHERS.
See Iron Age First Issue Each Month.
WESTVILLE, CONN.




WICKWIRE BROTHERS, CORTLAND, N. Y.,
MANUFACTURERS OF
WIRE CLOTH and WIRE GOODS,
"CORTLAND"
WINDOW SCREEN
WIRE CLOTH.
Dish Covers,
Corn Poppers,
Coal Sieves
Flour Sieves,
Etc., Etc.
Metallic Stove Sieve.




OGDEN & WALLACE,
85, 87, 89 & 91 Elm St., New York.
Iron and Steel
Of every description kept in stock.
Agents for Park, Brother & Co.'s
BLACK DIAMOND STEEL.
All sizes of Cast and Machinery Steel constantly on hand.

PIERSON & CO.,
ESTABLISHED 1790,
24 to 27 West St., cor. Morris,
NEW YORK CITY.

ULSTER IRON.

All Sizes and Shapes Kept in Stock.

ABEEL BROS.,
IRON MERCHANTS,
190 SOUTH ST., NEW YORK.
365 WATER ST., NEW YORK.
"A. R. M. CO." SHAFTING.
ALSO GENERAL ASSORTMENT OF
"NORWAY," "ULSTER," "CATASAUQUA,"
REFINED AND COMMON IRON,
BAND, HOOP AND SCROLL IRON.
STEEL OF ALL KINDS.
TELEPHONE CALL, "NASSAU, 379."

A. R. WHITNEY & CO.,
Iron and Steel

AGENCIES:
PORTAGE IRON CO., Limited, Merchant Iron and
Soft Steel.
NORWAY STEEL & IRON CO., Homogeneous
Steel Plates.
BAY STATE IRON CO., Tank, Boiler and Girder
Plates.
BRANDYWINE ROLLING MILL, Boiler Plates.
JLAWGOW TUBE WORKS, Boiler Flues.
A. M. BYERS & CO., Wrought Iron Pipe.
CARNEGIE BROS. & CO., Limited, Iron and
Steel Beams, Channels, Shapes and Shafting.
H. P. NAIL CO.'s Steel Wire Nails.
THE CHESTER PIPE AND TUBE CO.

Plans and estimates furnished and contracts
made for erecting Iron Structures of every descrip-
tion. Books containing cuts of all iron made sent
on application by mail. Sample pieces at office.
Please address 55 Hudson St. New York.

BORDEN & LOVELL,
Commission Merchants,
70 & 71 West St.,

L. N. LOVELL, NEW YORK.
C. A. GREENE,
H. C. FREELAND.

Agents for the sale of

Fall River Iron Co.'s Nails,
Bands, Hoops & Rods,

AND
Borden Mining Company's
Cumberland Coals.

VOUGHT & WILLIAMS,
MACHINERY, TIRE AND
SPRING STEEL.

AGENTS FOR HELLER BROS.

Clay Crucible Cast Steel.
288 GREENWICH STREET, NEW YORK.

IMPORTED & AMERICAN

PIG IRON.

LAKE SUPERIOR CHARCOAL IRON,
For Malleable and Car-Wheel Purposes,
A SPECIALTY.

CHARLES HIMROD & CO.,
CHICAGO AND DETROIT.

PASSAIC ROLLING MILL CO.,
Manufacture and have always in stock
ROLLED IRON BEAMS,
Channels, Angles, Tees, Merchant Bars, Riveted Work,
Forgings, Eye Bars, &c.
PATERSON, N. J.
Room 45, Astor House, New York.

CUT NAILS.

Hot Pressed Nuts, Bolts, Washers, &c.

DOVER IRON CO.'S

BOILER RIVETS,

Boiler Brace Jaws, Socket Bolts, &c.

FULLER BROTHERS & CO.,

139 Greenwich Street, New York.

Marshall Lefferts & Co.,
90 Beekman St., New York City,
MANUFACTURERS OF

Galvanized Sheet Iron,

Best Bloom, Best Refined and Common.
Galvanized Wire, Telegraph and Fence; Galvanized
Hoop and Band Iron, Galvanized Rod and Bar Iron,
Galvanized Nails, Galvanized Chain, Galvanized Iron
Pipe.

CORRUGATED SHEET IRON
For Roofing, &c., Galvanized, Plain or Painted.
Best Charcoal, Best Refined and Common
SHEET IRON.

PLATE AND TANK IRON,
C. No. 1, C. H. No. 1, C. H. No. 1 Flange, Best Flange,
Best Flange Fire Box, Circles.

ALL DESCRIPTIONS OF
IRON WORK GALVANIZED OR TINNED TO ORDER.
Price list and quotations sent upon application.

FOX & DRUMMOND,
RAILWAY AND ROLLING MILL
MATERIAL,
68 Wall Street, NEW YORK.

JAMES WILLIAMSON & CO.,
SCOTCH AND AMERICAN

PIG IRON,
No. 63 Wall St., New York.

Ulster Iron Works,
SAUGERTIES, ULSTER COUNTY,
NEW YORK.

WILLIAM MULLIGAN,

DANIEL F. COONEY,
85 Washington St., N. Y.
BOILER PLATES AND SHEET IRON,
LAP-WELDED BOILER FLUES,
Boiler Rivets, Angle & T Iron, Cut Nails & Spikes.
Agency for Glasgow Iron Co., Jos. L. Bailey & Co.
Pine Iron Works, Lebanon Rolling Mills, Chester
Pipe and Tube Co., Albany & Sons, Iron and Steel
Co.'s celebrated Boiler Rivets; Homogeneous Steel,
Boiler and Fire-Box Plates.

C. W. LEAVITT, EDWARD CORNING,
C. W. LEAVITT & CO., 161 BROADWAY,
NEW YORK.

NEW AND SECOND-HAND
RAILS, LOCOMOTIVES AND CARS.
PIG AND BAR IRON, OLD RAILS AND SCRAP IRON.
(ALLENTOWN ROLLING MILLS,
ATWOOD HEMP CAR WHEEL CO.,
PARDEE CAR & MACHINE WORKS.)

B. F. JUDSON,
Importer of and Dealer in
SCOTCH AND AMERICAN

Pig Iron,
Wrought & Cast Scrap Iron,
OLD METALS.
457 & 459 Water St., NEW YORK.
231 & 233 South St.,

PHIPPS & BURMAN'S
HORSE CLIPPERS
IN STOCK.

JOHN BROWER,
81 Murray St.,
NEW YORK.

CHAS. F. LOMBARD
Augusta, Ga.
MANUFACTURERS OF
GIN RIBS &
RAILROAD CASTINGS.

WM. McFARLAND,
Iron and Brass Founder,
TRENTON, N. J.

Chilled Cast Wire Dies a Specialty.
Any size or style made at short notice.

OXFORD
IRON AND NAIL CO.,
Cut Nails
AND
SPIKES.

J. S. SCRANTON, Sales Agent,
81, 83 and 85 Washington Street,
NEW YORK.

HARRISON & GILLOON
IRON AND METAL DEALERS,
55, 56, 57 WATER ST. & 321, 324, 326 CHERRY ST.,
NEW YORK.

have on hand, and offer for sale, the following:
Scotch and American Pig Iron, Wrought, Cast and
Machinery Scrap Iron, Car Wheels, Axles and Heavy
Wrought Iron; also old Copper, Composition, Brass,
Lead, Pewter, Zinc, &c.

BURDEN'S
HORSE SHOES.

"Burden Best"
Iron
Boiler Rivets.

THE BURDEN IRON CO.
TROY, N. Y.

ULSTER
AND
BURDEN'S
H. B. & S. Bar Iron.

Also Best Grades of
American & English Refined Iron.
All sizes and shapes in stock.

EGLESTON BROS. & CO.,
166 South St., NEW YORK CITY.
267 Front St.,

WILLIAM H. WALLACE & CO.,
IRON MERCHANTS
Cor. Albany & Washington Sts.,
NEW YORK CITY.

WM. H. WALLACE, WM. BISPRAM, E. C. WALLACE.

BOLT & RIVET CLIPPERS.
For cutting off the ends of Bolts and Rivets, on
carriages, wagons, harness, etc. Ask for them
where you buy your hardware, or send for cir-
lar and price list.

CHAMBERS, BROTHER & CO.,
52d St., below Lancaster Ave.,
Philadelphia, Pa.

R. D. WOOD & CO.,
PHILADELPHIA,
Manufacturers of

Cast Iron Pipe
FOR WATER AND GAS,
LAMP POSTS, VALVES, ETC.

Mathew's Pat. Anti-Freezing Hydrants.
400 CHESTNUT STREET.

VARIETY METAL BOOM.
Iron Foundry and Machine Shop.
STEAM HEATING BY DIRECT RADIATION
in all its Branches a Specialty. Brass and other
Metal Moulding, Casting and Finishing. Noiseless
Vertical Engines, Hydrants, Fire Plugs, &c.

FRAS. H. HANNAN,
Pottsville, Schuylkill Co., Pa.

SONS
HALL & SONS
BUFFALO, N. Y.

FEED WATER
PURIER
FOR STEAM BOILERS

W. D. WOOD & CO., L'd,



PATENT

Planished Sheet Iron.

Patented March 14th, 1865; April 8th, 1871;
Sept. 9th, 1873; Oct. 6th, 1874; Jan. 11, 1876.

Guaranteed fully equal in all respects to the
IMPORTED RUSSIA IRON,
and at a much less price.

FOR SALE
By all the principal
METAL DEALERS
In the Large Cities throughout
THE UNITED STATES,
And at their Office,

111 Water Street, Pittsburgh, Pa.

SYRACUSE MALLEABLE

IRON WORKS,

SYRACUSE, N. Y.

Mower and Reaper Castings
and Carriage Irons a
Specialty.

W. B. BURNS, Proprietor.

PENNSYLVANIA IRON WORKS

Everson, Brown & Co.,
SECOND AVE., PITTSBURGH, PA.,
MANUFACTURERS OF

Light Sheet Iron.
ROOFING SHEET
of all grades a specialty.
Prices quoted promptly upon application.

CORRUGATED AND CRIMPED IRON ROOFING & SIDING,

IRON BUILDINGS, ROOFS, SHUTTERS, DOORS, CORNICES
Skylights, Bridges, &c.
MOSELEY IRON BRIDGE AND ROOF CO.,
5 Day Street, NEW YORK.

GEORGE WESTINGHOUSE, Jr., Pres't
H. H. WESTINGHOUSE, Gen'l Agt.
JOHN CALDWELL, Treas.
T. W. WELSH, Supt.
W. W. CARD, Secy.

THE

Westinghouse Air-Brake Co.

PITTSBURGH, PA., U. S. A.,

MANUFACTURERS OF THE
WESTINGHOUSE AUTOMATIC BRAKE, Westinghouse Locomotive Driver
Brake, Vacuum Brakes (Westinghouse & Smith Patents).

WESTINGHOUSE FREIGHT BRAKE.

The Automatic Freight Brake is essentially the same apparatus as the Automatic Brake for
passenger cars, except that the various parts are so combined as to form practically one piece of
mechanism, and is sold at a very low price. The saving in accidents, flat wheels, brakemen's wages,
and the increased speed possible with perfect safety, will repay the cost of its application within
a very short time.

The "Automatic" has proved itself to be the most efficient Train and Safety Brake known. Its
application is instantaneous; it can be operated from any car in the train if desired, and should the
train separate, or hose or pipe fail, it applies automatically. A GUARANTEE is given customers
against loss from PATENT SUITS on the apparatus sold them.

The WESTINGHOUSE BRAKE is now fitted to upward of
15,000 ENGINES AND 80,000 CARS,
and is adopted by the principal Railways in all parts of the world.

FULL INFORMATION FURNISHED ON APPLICATION.

LEECHBURG IRON WORKS.

KIRKPATRICK & CO., LIMITED,
Manufacture of all Grades of

FINE SHEET IRONS,
(Refined, Cold Rolled, Show Card, Stamping, Tea Tray, Polished, Shovel, Ferrule Iron, &c.)
NATURAL GAS USED AS FUEL.

OFFICE, No. 143 First Ave., Pittsburgh, Pa.

CHAMPION
HOG RINGER
RINGS AND HOLDER.
Only double ring ever
invented. The only
ring that will effectu-
ally keep hogs from
rooting. No sharp
points in the nose.

EAGLE BILL
CORN HUSKER
is the best Husker in the
market. Farmers say it
is the best. Use no other.

Ringers, 75c. Rings, 50c. 100. Holders, 75c. Huskers, 15c.
CHAMBERS, BERING & QUINLAN, Exclusive Manufacturers, Decatur, Ill.

JOHN J. BROWNE, President.
ALEXANDER DUNN, Manager.

THE JERSEY CITY GALVANIZING CO.,
MANUFACTURERS OF
GALVANIZED MATERIAL OF EVERY DESCRIPTION.
GALVANIZING IN ALL ITS BRANCHES.

Galvanized Sheet Iron—Best Bloom, Best Refined, Common. Galvanized Round, Square Band and
Hoop Iron, &c., &c.

All Sizes
of Corrugation
from
1 1/2 to 5 inches.

All Gauges
and
Sizes
of Sheets.

Corrugated Sheet Iron a Specialty. Galvanized, Black and Painted. Iron Corrugated for the Trade.
Estimates furnished on application.

WORKS GREEN AND BAY STREETS, JERSEY CITY, N. J. OFFICE AND WAREHOUSE, 98 JOHN STREET NEW YORK.

JAMES P. WITHEROW,
Successor to WITHEROW & GORDON,
Engineer & Contractor,
PITTSBURGH, PA.

Agent for the

WHITWELL
HOT BLAST STOVES
OVER 600 IN USE.

The following parties either have them in use or
under construction:

Cedar Point Iron Co., N. Y.
Dunbar Furnace Co., Pa.
Crane Iron Co., Pa.
Pennsylvania Steel Co., Pa.
Neshannock Iron Co., Pa.
R. H. Coleman, Lebanon, Pa.
Chester Rolling Mill Co., Pa.
Davenport, Fairbairn & Co., Pa.
Isabella Furnace Co., Pa.
Faxon Furnace, Pa.
Spearman Iron Co., Pa.
Etna Iron Works, Ohio.
Milton Coal and Iron Co., Ohio.
Winona Furnace Co., Ohio.
Woss & Marshall, Ohio.
H. Campbell & Sons, Ohio.
Hocking Valley Iron Co., Ohio.
Cleveland Rolling Mill Co., Ohio.
Meier Iron Co., Ill.
North Chicago Steel Co., Ill.
Union Iron and Steel Co., Ill.
Means & Culbertson, Ky.
Ashland Furnace Co., Ky.
Norton Iron Co., Ky.
Southern States C. I. and S. Co., Tenn.
Sewanee Furnace Co., Tenn.
James C. Warner, Rising Fawn, Ga.
Ohio Iron Co., Zanesville, O.
Sloss Furnace Co., Ala.

WHEELING NAILS.

Laughlin Nail Co.,

W. K. ROSS,

SOLE AGENT,

97 Chambers Street, New York.

Manhattan Rolling Mill.

J. LEONARD,

445 to 451 West St., NEW YORK,
177 & 179 Bank St.,

MANUFACTURER OF

HORSE SHOE IRON,
Toe Calk Steel, Rods, Ovals, Half Ovals and Flats.

KEYSTONE ROLLING MILL, Limited,

Manufacturers of

IRON,

Pittsburgh, Pa.

Bonnell, Botsford & Co.,

IRON, NAILS AND SPIKES

YOUNGSTOWN, OHIO.

WILLIAM R. HART & CO.,
AMERICAN AND FOREIGN
PIG IRON, SPIEGELEISEN,
Steel Blooms, Crop Ends, Tin Plates, &c.
No. 224 South Third St. PHILADELPHIA.

HENRY LEVIS & CO.,
Manufacturers' Agents
For Iron and Steel Rails, Car Wheels, Boiler and
Sheet Iron and General Railway
Equipments.
Old Rails, Axles, and Wheels bought and sold.
224 S. 4th St., Philadelphia.

Heavy Rails, Light Rails,
Railway Fastenings,
STREET
Cambria Steel Rails.
RAILS.
ADDRESS:
Cambria Iron Co.,
Office, 218 South Fourth St., Philadelphia, Pa.
Works, Johnstown, Pennsylvania.

THE PHOENIX IRON CO.,
410 Walnut Street, PHILADELPHIA.
Manufacturers of Wrought Iron

Beams, Deck Beams, Channels, Angle & Tee Bars.
STRAIGHT AND CURVED TO TEMPLATE.
Largely used in the construction of Iron Vessels, Buildings and Bridges.
WROUGHT IRON ROOF TRUSSES, GIRDERS & JOISTS,
and all kinds of Iron Framing used in the construction of Fire Proof Buildings.
PATENT WROUGHT IRON COLUMNS, WELDLESS EYE BARS,
and built up shapes for Iron Bridges.
REFINED BAR, SHAFING, and every variety of SHAPES IRON made to order.
Plans and Specifications furnished. Address **DAVID KEEVES, President.**
NEW YORK AGENTS, **MILLIKEN & SMITH, 95 Liberty Street.**
BOSTON AGENTS, **FRED. A. HOUDLETTE & CO., 19 Battery March St.**

ALAN WOOD & CO.,
MANUFACTURERS OF
Patent Planished, Galvanized, Common, Best Refined, Cleaned and Charcoal Bloom
PLATE & SHEET IRON,
ALSO LIGHT PLATES AND SHEETS OF STEEL.
No. 519 Arch Street, Philadelphia, Pa.
Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smoke Stack,
Tank and Boat Iron; Last, Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

W. H. WALBAUM & CO.,
206 S. Fourth St., Philadelphia. 61 Pine St., New York.
NEW AND OLD RAILS, BLOOMS, BESSEMER PIG,
Crop Ends, Spiegeleisen, Iron Ores and Railroad Supplies Generally.
AGENTS IN THE UNITED STATES FOR
THE NORTH LONSDALE IRON & STEEL CO., Limited, Bessemer Pig Iron, brand "Ulverston,"
Malleable Pig Iron, brand "U. H. M."
MOSS BAY HEMATITE IRON & STEEL CO., Limited, Spiegeleisen, Crop Ends, &c.
Also for "Lorn" Malleable Charcoal Pig Iron and N. B. ALLEN & CO.'S Dinas Fire Bricks.
Also Sole Agents for the WHITE RIVER MINING CO.'S Arkansas Manganese Ore, Guaranteed 50 per
cent. Metallic Manganese.

NAILS
JAS. ROWLAND & CO.,
Kensington Iron, Steel & Nail Works,
290 North Delaware Ave., - PHILADELPHIA,
Manufacturers of the
ANVIL BRAND REFINED MERCHANT BAR IRON.
Also, the James Rowland & Co. Kensington ★ Nails, cut from
their Refined Anvil stock. Also, Flow and Cultivator Steel; Skelp
Iron a specialty; also Rounds, Squares, Flats, Bands and Hoop
Iron.

PENCOYD IRON WORKS.
A. & P. ROBERTS & CO.,
MANUFACTURERS OF
BEAMS, CHANNELS, DECK BEAMS,
ANGLES, TEES, PLATES, MERCHANT BAR.

SHAFTING AND ROLLED OR HAMMERED AXLES OF IRON OR STEEL.
Office, No. 36 S. Fourth St., Philadelphia. Agents for the sale of Glamorgan Pig Iron.

J. W. PAXSON & CO.,
DEALERS IN
MOULDING SAND,
1021 North Delaware Avenue, PHILADELPHIA, PA.


MANUFACTURERS
CHARCOAL FACING,
ANTHRACITE FACING,
SOAPSTONE,
LEAD FACING,
RIDGES, SHOVELS,
STEEL BRUSHES.
X MINERAL,
IX MINERAL,
IXL FACING,

THE ALLENTOWN ROLLING MILLS,
Manufacturers of
Rails, Bars, Axles, Shafting, Fish Bars (Plain and Angle), Spikes,
Rivets, Bolts and Nuts, &c. Bridges and Turn Tables.
General Office, 237 South Third St., Philadelphia. Works at Allentown, Pa.

RIVERSIDE IRON WORKS,
MANUFACTURERS OF RIVERSIDE
STEEL NAILS
Pig Iron, Bar Iron, Bar Steel, Steel Blooms, Steel Billets,
Small T Rails, Flat Rails of Iron or Steel, Fish Bars of Iron or Steel,
WHEELING, W. VA.

Edward J. Etting,
IRON BROKER AND COMMISSION MERCHANT,
223 S. Third St., Philadelphia, Pa.
Pig, Bar and Railroad Iron.
OLD RAILS, SCRAP, &c.
Agent for the
MOUNT SAVAGE FIRE BRICK,
The Allentown Iron Co. and the
Greenwood Rolling Mill.
STORAGE WHARF AND YARD
DELAWARE AVENUE ABOVE CALLOWHILL STREET,
connected by track with railroad.
Cash advances made on Iron.

JAR. G. LINDSAY. THOS. S. PARVIN.
LINDSAY, PARVIN & CO.,
Successors to LLOYD & LINDSAY,
328 Walnut Street, Philadelphia.
Iron Ship and Bridge Builders' Materials, Steel
and Iron Shapes and Bars, Sheet Iron, Sheet Steel,
Pig Iron, Muck Bars, Plate Girders for Bridges and
Buildings. Contracts placed for Iron Structures.

Ethelbert Watts. Jos. C. Poulterer.
ETHELBERT WATTS & CO.,
Iron Brokers and Commission Merchants,
Office, No. 220 So. Third Street, Phila.
SALES AGENTS FOR
CORNWALL ORE BANK CO., IRON ORES.
CROMWELL IRON CO.,
VESTA FURNACE, HARGETT FURNACES, PIG IRON.
MANSIE, EVERETT & POST, PIG LEAD & SPELTER.
Chicago and St. Louis. Correspondence Solicited.

L. & R. WISTER & CO.,
IRON COMMISSION MERCHANTS,
230 So. 4th St., Philadelphia.
AGENTS
Kemble and Norway Foundry and Forge Pig Iron.
Wyebooke C. B. Charcoal Pig Iron. Buchanan
Red Short Pig Iron.
DEALERS IN ALL KINDS OF SCRAP IRON.

MORRIS, WHEELER & CO.,
IRON, STEEL & NAILS.
WAREHOUSE AND OFFICES, 16th & Market Sts., PHILA., PA.
SALES OFFICES
409 Chestnut St., PHILA., PA.
New York Address, 14 CLIFF ST.

REUBEN HAINES,
CHEMIST,
738 Sansom St., Philadelphia.
Analysis of Ores of Iron and other Metals,
Pig Iron and Steel. Assay of Gold and
Silver Ores. Water Analysis for
Manufacturing and Household Use.

TAYLOR-LANGDON GAS-ROASTED
BESSEMER ORE,
Specially adapted to Soft Foundry or Highest
Grades of Mill Iron.

J. WESLEY PULLMAN,
240 So. 3d St., Philadelphia.

NORTH BROTHERS,
Iron Founders,
LIGHT CASTINGS A SPECIALTY.
N. W. Cor. 23d and Race Streets,
PHILADELPHIA.
Correspondence solicited.

TESTED CHAINS.
BRADLEE & CO., EMPIRE CHAIN WORKS,
816 Richmond St., - - - PHILADELPHIA.
Chains for Foundry Cranes and Slings.
"D. B. C." Special Crane Chain.
Steel and Iron Dredging, Slope and Mining Chains.
Ship's Cables and Marine Railway Chains.

CUMBERLAND NAIL AND IRON CO.,
MANUFACTURERS OF
"Cumberland" Nails and Wrought Iron Pipe,
43 North Water Street and 44 North Delaware Avenue, PHILADELPHIA.
J. TATNALL LEA & CO.,
Successors to CABERN & CO.,
IRON COMMISSION MERCHANTS,
No. 400 Chestnut Street, Philadelphia.
BESSEMER, MILL AND FOUNDRY PIG IRON, SKELP IRON, MUCK AND SCRAP BARS NATIVE
AND FOREIGN ORES. AGENTS FOR CONNELLSVILLE COKE.


LOCOMOTIVE AND CAR-WHEEL TIRES
Manufactured from the celebrated OTIS STEEL BRAND
STANDARD
Quality and efficiency fully guaranteed. Prices as low
as any of the same quality. We manufacture Heavy and
Light Forgings, Driving and Car Axles, Crank Pins, Piston
Rods, &c.
THE STANDARD STEEL WORKS,
Works at LEWISTOWN, PA.
Office: - - 220 S. 4th St., Philadelphia, Pa.
BOOTH, GARRETT & BLAIR,
ANALYTICAL AND CONSULTING CHEMISTS,
919 and 921 Chant St. 10th St. above Chestnut St., Philadelphia, Pa.
Established in 1836.

Analyses of Ores, Waters, Metals and Alloys of all kinds. A special department for the
ANALYSIS OF IRON AND STEEL,
fitted with all the apparatus and appliances for the rapid and accurate analysis of Iron, Steel, Iron
Ores, Slags, Limestones, Coals, Clays, Fire Sands, &c. Agents for sampling ores in New York and
Baltimore. Price lists on application.

JUSTICE COX, JR. CHARLES K. BARNES.
JUSTICE COX, JR., & CO.,
AGENTS FOR
CHICKIES, CONEWAHO, MONTGOMERY AND
SHENANDOAH
Foundry & Forge Pig Iron.
CARBON ROLLING MILL CO., Limited,
Best Quality Muck Bar.
CATASAUQUA MFG. CO.'S
Bar, Angle, Skelp and Sheet Iron.
Shenandoah (Va.) Best Charcoal Blooms.
No. 224 So. Fourth St., PHILADELPHIA.

JEROME KEELEY & CO.,
206 Walnut Place, Philadelphia.
SELLING AGENTS FOR
CHARCOAL AND ANTHRACITE BLOOMS, PIG IRON,
BAR IRON, SHEET IRON, STEEL AND IRON RAILS,
IRON CLAD STEEL RAILS AND BARS, MAGNETIC
AND HEMATITE IRON ORES, FIRE BRICK, COAL
and COKE, MUCK BARS, Handle Old Iron and Scrap
Rail, Scrap Iron &c. Examine and negotiate sales of
Iron and Coal properties.
E. H. Wilson. A. Kaiser. J. B. M. Hiron.
E. H. WILSON & CO.,
230 South Third Street, Philadelphia.
BROKERS AND DEALERS IN
IRON AND STEEL.
Correspondence solicited.

J. W. HOFFMAN & CO.,
IRON COMMISSION MERCHANTS,
308 South Fourth St., Philadelphia.
SELLING AGENTS.
PINE IRON WORKS, Pine Brand Plates; GLASGOW
IRON CO., Plates and Muck Bars; SPRANG STEEL &
IRON CO., (Limited), Siemens-Martin (on Beardy)
Steel, Universal and Sheared Plates, Angles and
Shapes.

JNO. L. HOGAN. RICH'D M. ELLIOT.
HOGAN & ELLIOT,
411 & 413 WALNUT ST., PHILADELPHIA.

IRON AND ORES,
Old Rails, Wrought and Cast
Scrap, Iron and Steel Blooms
and Billets.

AGENTS FOR: Brier Hill Iron and Coal Co., Pig
Iron Low Moor Iron Co., of Virginia, Pig Iron.
Mount Hope Special Strength Charcoal Pig Iron.
Youngstown Steel Co. Washed Metal, for Open
Hearth and Crucible purposes. Connellsville Coke.
Low Phosphorus Bessemer Pig Iron a Specialty.

ANDOVER PIG IRON,
FOR BEST MILL PRODUCTS.
Andover Chill Iron for Castings, &c.
Each pig marked exact chill depth 1/4 inch to 1/2
inch, A. Wainey & Son's standard test.
F. A. COMLY, Treas. J. WESLEY PULLMAN, Agent.
240 So. 3d St., Philadelphia.

J. J. MOHR,
430 Walnut St., PHILADELPHIA, PA.
Sole Agent for
Sheridan, Leesport, Temple, Lynch-
burg, Millcreek and Mt. Laurel
FOUNDRY and FORGE PIG IRON,
CHARCOAL PIG IRON,
Also
WOODBIDGE CLAY MINING CO.'S FIRE BRICK.

New Inventions.
J. Goodrich, of Henry, Ill., has patented
a vise attachment to benches. An upright
bar is secured to the bench, at some distance
from it, by means of two horizontal cross-
pieces. This bar forms the central stock of
the vise. The jaws are secured to the right
and left sides of the stock and are curved
over the same to form the biting edges. A
head and a tail screw passing through the
jaws and stock connect the parts and permit
the jaws to be opened and closed. The
screws do not pass through the jaws directly,
but through nuts which are seated in re-
cesses formed in the jaws. The nuts are of
spherical form and the jaws have correspond-
ing spherical seats. To prevent the
nuts from turning a portion of their surface
is flattened, and the sides of the jaws take
over these flattened portions and hold the
nuts in place. This improvement may also
be applied to hand vises and brace wrenches.

A furnace door which is locked in its open
and also in its closed position has been pa-
tented by T. R. Butman, of Cleveland, Ohio.
The door is provided at its upper edge with
laterally-projecting pintels which rest in
lugs cast on the door frame. One of the
pintels is provided with a notched disk
which is engaged by a weighted pawl. By
placing the pawl into either of the notches
the door is held open to a greater or less ex-
tent. The other pintel likewise carries a
notched disk, but the notches are cut in an
opposite direction, so that the engaging pawl
serves to lock the door when closed. The
door frame is provided with flaring side
pieces which guide the fuel to the mouth of
the furnace. Preferably, the door is made
of an upper and lower section riveted to-
gether. As the lower section will be de-
stroyed first, it may be removed and re-
placed.

A. M. White and T. W. Hodgson, of Rome,
N. Y., have patented an arrangement for
supporting the crown-bars of a fire-box.
The object of the patented improvement is
to permit free circulation of water over the
crown-sheet. The crown-sheet and side
sheets are riveted together in the ordinary
manner, and the upper edge of each side
sheet laps over and is compressed against
the side of the crown-sheet, so as to form a
concave channel. The crown-bars are sup-
ported by castings which have a down-
wardly-projecting nose that fits into the
channel of the side sheets. In this way the
castings are supported solely by the side
sheets, and consequently an unobstructed
space for the free circulation of water is
left over the crown-sheet. The crown-bars
rest upon straight shoulders formed on the
castings and are united to the latter by
rivets.

An oil can with a filling attachment has
been patented by W. Snow, of Mount Ver-
non, Dakota Territory. The can is of the
usual form, and has the customary nozzle.
A cap somewhat of the shape of a thimble,
but with an upper flanged opening, is
slipped over the nozzle, and rests with its
bottom upon a bead struck up around the can
body. When in this position the cap is held
in place by friction. If the can is to be
filled the nozzle is removed and the cap is
inverted, fitting with its flanged neck into
the can opening formerly occupied by the
nozzle. In this way the oil can be poured in
without spilling.

Rolls for forming link blanks, and particu-
larly blanks used for weldless car-coupling
links, have been patented by J. T. Wright,
of New Albany, Ind. Each roll has formed
upon its circumference four more or less
raised projections or ribs extending from
end to end. These ribs form the dies for
severing the blanks. They are made with
concave sides corresponding to the desired
curve of the end of the blank, and the dis-
tance between them is equal to the length of
the blank. The rolls sever the blanks and
at the same time form the end curves. They
also, it is claimed, condense the metal at the
ends and thus increase the strength of the
link at the point where it is subjected to the
severest strain.

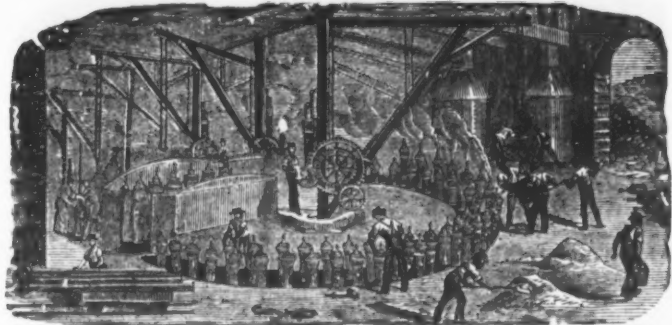
An improvement in a wire-drawing ma-
chine has been patented by H. L. Rawson,
of Worcester, Mass. The improvement is
designed to automatically stop the revolution
of the receiving reel as soon as a snarl in the
wire prevents its passage through the reduc-
ing die. The delivery reel is so connected
to the work-table that when the wire is
caught the reel will be pulled over or
slightly tilted. This motion puts into action
a train of levers, which in turn raise the re-
ceiving reel and disconnect it from the
gearing that revolves it. Thus the break-
ing of the wire, which would take place if
the receiving reel would continue to re-
volve, is prevented. The motion of the re-
ceiving reel may also be stopped in the
usual way by pressing upon a treadle, but
this method is only to be used when the ma-
chine is to be definitely stopped.

E. Tucker, Jr., of Worcester, Mass., is the
patentee of a new process of annealing wire
and covering it with a metallic coating.
Heretofore the wire was run first through a
lead bath, then through a solution of muri-
atic acid, and finally through a zinc bath.
This would cause the formation in the zinc
bath of a metallic alloy of zinc and iron
termed "stodge." The inventor proposes to
utilize this substance and to substitute it for
the lead. The wire is first run through the
alloy, and then through the acid and zinc,
as usual. It is claimed for this invention
that the wire treated as described is annealed
with better advantage and with less ex-
pense. Moreover, the alloy, when once
heated, retains its heat longer than the lead
will, and consequently less fuel is required.

A simple fence-wire stretcher has been
patented by H. McIntosh, of Decorah, Iowa.
The device consists essentially of a T-shaped
casting carrying a loose grooved roller at
each end of the horizontal bar. The upright
bar is provided at its bottom with a flange
projecting forward, in which is a screw-
threaded perforation. Through this per-
foration passes an upright screw which has
an oblong eye at its bottom and a swiveled
head at its top. In use the two grooved
rollers are placed upon the wire to be
stretched, and the wire between the rollers
is laid into a groove on the top of the
swiveled head. The screw is next revolved
by means of a key or lever introduced into
the eye. As the screw rises the head carries

A. H. McNEAL,

BURLINGTON, N. J.



FLANGE PIPES.

General Foundry Work.

CAST IRON PIPES,

FOR WATER AND GAS.

ESTABLISHED IN 1848.

SINGER, NIMICK & CO., Limited,

PITTSBURGH, PA.,

MANUFACTURERS OF ALL KINDS OF

HAMMERED AND ROLLED

STEEL,

Warranted Equal to any Produced.

BEST REFINED TOOL CAST STEEL

For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-
Knives, Cold-Chisels and Machinists' Tools generally.

SAW PLATES

For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

Sheet Steel

For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws,
Stamping Cold, &c., &c.

SIEMENS-MARTIN (Open-Hearth) PLATE STEEL

For Boilers, Fire-Boxes, Smoke-Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement, is unequalled for
surface finish and exactness of gauge.

ROUND MACHINERY CAST STEEL

For Shafting, Spindles, Rollers, &c., &c.

File, Fork, Hoe, Rake, R. R. Frog, Toe-Cut, Sleigh-Shoe and Tire Steel, &c.,
Cast and German Spring and Flow Steel.Iron Center Cast Flow Steel. Finished Rolling Flow Coulters, with Patent Screw Hubs
"Soft Steel Center" Cast Flow Steel. Agricultural Steel cut to any pattern desired. [attached.
"Solid Soft Center" Cast Flow Steel. Steel Forgings made to order.

Represented at 243 Pearl & 18 Cliff Sts., New York, by

HOGAN & SON, General Agents for Eastern and New England States.
HOGAN & McCARGO, 417 Commerce St., Philadelphia, and FULLER, DANA & FITZ, 110 North St., Boston.

THE MIDVALE STEEL COMPANY,

CRUCIBLE AND OPEN-HEARTH STEEL.

TIRES and AXLES

OF EVERY DESCRIPTION.

Tool, Machinery and Spring Steel
Castings and Forgings.WORKS AND MAIN OFFICE, BRANCH OFFICE,
Nictown, Philadelphia, Pa. 333 Walnut St., Philadelphia, Pa.

"THE FRANKFORD STEEL WORKS,"

STEEL FORGINGS,
NONPAREIL TOOL STEEL,
MACHINERY STEEL.

FRANKFORD, PHILADELPHIA, PA."

ESTABLISHED 1847.

A. WHITNEY & SONS,

PHILADELPHIA.

CHILLED RAILROAD WHEELS

For every kind of service, including Street, Mine and Lumber Tramways. Wheels furnished
in rough-bored or on axles. Chilled Castings made to order.

PENNSYLVANIA STEEL COMPANY,

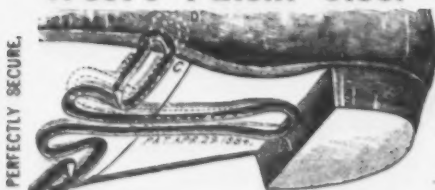
Steel Rails, Frogs, Crossings and Switches.

Forgings for Piston Rods, Guide Bars, Wrist Pins and Machinery Purposes.

Works at Baldwin Station, Pennsylvania Railroad, near Harrisburg, Pa.

Address all orders to
PENNSYLVANIA STEEL COMPANY, 208 South Fourth Street, Philadelphia.

West's Patent Steel Wire Ice Creepers.

NO SCREWS OR STRAPS REQUIRED.
Easily attached to either Shoes
or Rubbers.C. F. WEST & CO.,
No. 1940 Columbia Avenue,
PHILADELPHIA.Satisfaction guaranteed if used ac-
cording to directions, viz.: Push
into position. In taking off, spring open clip "C" same as dotted line "D."part "A" firmly into the heel, with clip "B" on outer edge of shoe, then spring clip "C"
into position. In taking off, spring open clip "C" same as dotted line "D."
For Sale by the Hardware Trade.
Send for samples and prices.

JANSEN HERNSHEIM & CO.,

16 & 18 Exchange Place, NEW YORK.

STEEL RAILS, BLOOMS AND WIRE RODS,
Bessemer, Scotch and Charcoal Pig Iron,
FERROMANGANESE SPIEGEL IRON, SCRAP IRON, &c., &c.

BRITTON IRON AND STEEL CO.,

MANUFACTURERS OF

IRON AND STEEL BOILER PLATE,
Tank, Bridge and Ship Plates,
BLACK AND GALVANIZED SHEET IRON.

Works foot of Wason St., cor. L. S. & M. S. R. R., CLEVELAND, O.

Established 1861.

THOMAS C. BURROWS,

Agent for Jersey City Steel Company,

STEEL

Of All Descriptions.

WAREHOUSE, 99 and 101 JOHN ST., NEW YORK.

CALUMET IRON & STEEL CO.,

MANUFACTURERS OF

OPEN HEARTH STEEL, PIG METAL,

MERCHANT BAR, IRON AND NAILS,

SIEMENS OPEN HEARTH STEEL CASTINGS FOR
RAILROAD, MACHINERY AND AGRI-
CULTURAL PURPOSES.

Offices, First National Bank Building, Chicago, Ill.

C. R. CUMMINGS, President. Works at Cummings,
D. C. BRADLEY, Vice-Pres. and Gen'l Mgr. Cook County, Ill.
J. M. BROWN, Sec'y & Treas.

GROVE, GRIER & CO., LIMITED,

PHILADELPHIA AND DANVILLE, PA.

STEEL WASHERS

AT SAME PRICES AS IRON WASHERS.

GUARANTEED FAR MORE RIGID THAN ANY IRON WASHERS,
AND EVERY WASHER PERFECTLY FLAT, WITHOUT DISH.

STANDARD STEEL CASTING CO.,

THURLOW, PA.,

Open Hearth and Crucible

STEEL CASTINGS.

QUALITY EQUAL TO STEEL FORGINGS.

Can be Bent, Welded or Forged.

STEEL INGOTS, Best Stock, Furnished to Order.

Ship Patterns direct to Thurlow, Pa.; via P. W. & B. R. R., or via P. & R. R. R.

We are prepared to make all kinds of Heavy or Medium Weight

STEEL CASTINGS

FROM

OPEN HEARTH METAL.

We wish to give special attention to making Cast Steel Rolls of all sizes, Mill
Gearing wherever Cast Steel is suitable. Also Cranks, Cross Heads, Shafts,
&c., for Steam and Blowing Engine construction.Being desirous of securing a share of public patronage, we will endeavor to make our
product equal in quality to any in the market.

MACKINTOSH, HEMPHILL & CO., Limited,

PITTSBURGH, PA.

Lawrence Curry Comb Co.,
509 EAST 22d ST., NEW YORK.Our line of perfect Combs is so well
known it needs no comment. Our El-
evated Back Comb please notice the cut,
all improvements, and will be sold at
prices that defy competition. We also
call your attention to our line of Mon-
key Wrenches. The improvements over
other wrenches are the 6-face from head
to ferrule, which is cast solid to the
ferrule, thus reinforcing main bar and
head specially; 25 per cent. greater
strength than any Wrench manufac-
tured. We have just completed our
entirely new Metallic Boring Machine
in addition to our regular line. Send
for Catalogue and Prices.

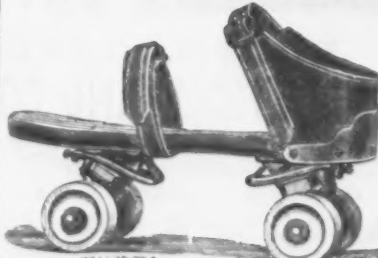
LAWRENCE CURRY COMB CO., 309 E. 22d St., New York City.



PAT. SEP 25 1883

THE RICHMOND ROLLER SKATE.

LATEST AND BEST.

It is light-running, simple in construction,
durable and complete in every respect.For Fancy and Rink Skating it is
superior to all others.

Liberal Discount to the Trade.

For Circulars, Prices and further informa-
tion, addressRICHMOND ROLLER SKATE and CASTER CO., Richmond, Ind.
E. C. MEACHAM ARMS CO., St. Louis Agents.

WROUGHT IRON

Boiler Tubes,

Steam, Gas and Water Pipe.
Oil Well Tubing, Casing and
LINE PIPE.

Cotton Presses, Forgings,
Rolling Mill and General
Machinery.

READING IRON WORKS,

261 S. Fourth St., Philadelphia.

FRANKLIN S. MILES,
Manufacturer of
Iron, Steel and German Silver
SCREWS, 205 Quarry St., Philadelphia.

The Common Sense Sash Holder and Lock Combined.

PATENTED MARCH 6th, 1885.

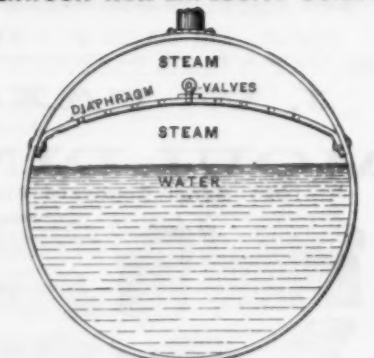
Is the best, cheap-
est and most com-
plete Sash Holder
and Lock in the
market, and we
think has the
largest sale. It
holds the window
at any point, and
locks the same
when down, and
entirely prevents
windows from
rattling.
I am the sole
owner of this
patent, and so a
manufacturer of
these fasteners,
and all persons
are hereby not-
ified of this fact.
Any parties in-
fringing will be
dealt with ac-
cording to law.
Parties who have
been buying and
selling the "Prac-
tical Fastener,"
so-called, will do
well to heed the
warning. Orders
from the trade
respectfully sol-
icited.

Circular with price list mailed on application.

H. A. WILLES,

MANUFACTURER AND DEALER IN HARDWARE
SPECIALTIES AND OIL AND GAS STOVES,
727 Market Street, PHILADELPHIA, PA.

THE LAWSON NON-EXPLOSIVE BOILER.

This is the only steam boiler ever devised in strict
compliance with the demands of natural laws. It
gives complete immunity against explosions, delivers
dry steam, prevents all incrustation and deposit on
the bottom plates, affords safety with high pressure,
and secures great economy. The invention is ap-
plicable to every style of boiler, and can be readily ap-
plied, internally or externally, to new or old boilers.
Licenses granted on liberal terms to manufacturers.
Send for description.LAWSON NON-EXPLOSIVE BOILER CO.,
155 and 157 Broadway, New York.

CARRIAGE HARDWARE.

LARGEST LINE OF
WROUGHT CARRIAGE FORGINGS
MADE BY ANY HOUSE.

Send for Catalogue and Discount Sheet.

The E. D. CLAPP MFG. CO.,
AUBURN, N. Y.

GEO. M. EDDY & CO.,

Manufacturers of
Measuring Tapes

Of Cotton, Linen & Steel,
FOR ALL PURPOSES.

351 to 353 Nassau Ave., Brooklyn, N. Y.

SILVER & DEMING MFG. CO.,
SALEM, OHIO, U. S. A.

MANUFACTURERS OF
Cistern, Pitcher, Well
and Force Pumps,
Wind Mill Pumps,
HAND AND POWER
ROTARY PUMPS,
Hydraulic Rams,
BOILER FEED PUMPS,
Garden Engines, &c.
Also, Carriage Makers' Tools,
Blacksmiths' Drills, Butchers'
Tools, and Feed Cutters.

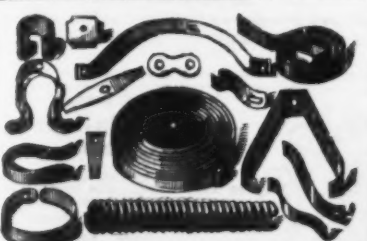
Write for Catalogue and Prices.

EUROPEAN AGENCY WITH
SELIG, SONNENTHAL & CO.
London, E. C., England.

GIES & CO.
LITHOGRAPHERS
AND
PRINTERS
POSTERS
SHOW CARDS
CIRCULARS
BUFFALO, N. Y.
SPECIALTY
BLANK BOOKS MADE TO ORDER.
WOOD ENGRAVING AND ELECTROTYPING

JOHN MAXWELL,
Manufacturer of
Patented
BRASS, BRIGHT
TINNED WIRE
& JAPANNED
Bird Cages.
The cheapest and most
saleable in market.
Catalogues and Price
Lists furnished to the
trade.
247 & 249 Pearl St.,
New York.

Full size of Band for Brass and Tinned Wire Cages.



DUNBAR BROS.,
Manufacturers of
Clock Springs and Small Springs
of every description, from best Cast Steel.
BRISTOL, CONN.

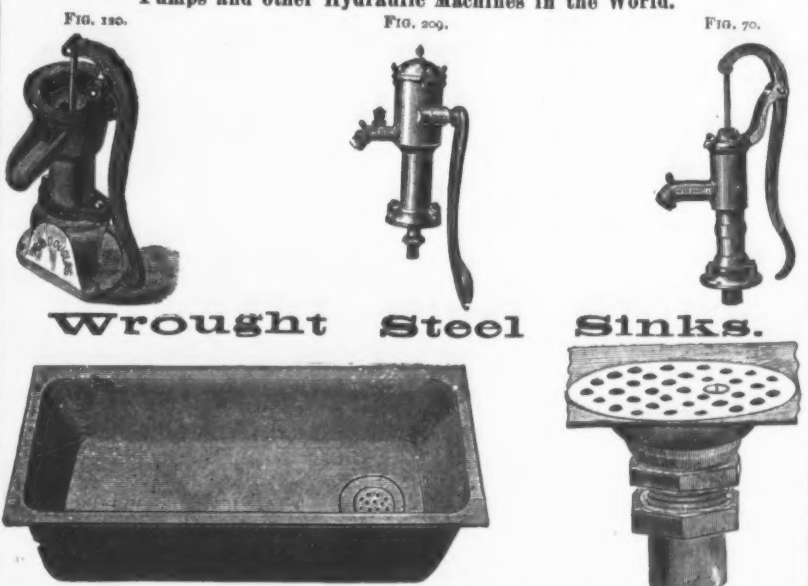
**DETROIT BLOCK
WORKS,**
Detroit, Mich.
MANUFACTURERS OF
EVERY VARIETY OF
Tackle Blocks
AGENTS:
JOHN H. GRAHAM & CO., New
York.
O. S. CHAMBERLAIN, Chicago.
ST. LOUIS RY SUPPLIES MFG.
CO., St. Louis.

OVERHEAD RAILWAY,
With Switches and Turntables,
THE
HARRINGTON HOISTS,
Wythe Elevators,
WITH AUTOMATIC STOP.
J. Q. MAYNARD,
12 Cortlandt Street,
NEW YORK.

NEW MAKE OF MINE LAMP.
THREE DIFFERENT
SIZES
SPRINGS
SEND
15 CENTS
FOR SAMPLE
TO
LEONARD BROS., Scranton, Pa.

PATENTS
AND PATENT SUITS.
Please send for Circular to
THOMAS D. STETSON,
28 Murray St., New York.
Samuel Martin,
MANUFACTURER OF
Theatrical Hardware,
127 Eighth Avenue, NEW YORK.

W. & B. DOUGLAS,
MIDDLETOWN, CONN.,
The Oldest and Most Extensive Manufacturers of
PUMPS, HYDRAULIC RAMS, GARDEN ENGINES,
Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill
Pumps and other Hydraulic Machines in the World.



One of the strong points of these sinks is the new coupling with which they are now supplied and which is pronounced by all plumbers the best on the market. It is used with both lead and wrought-iron pipe; is a neat, reliable coupling, and is easily detached for the purpose of pumping out the pipe. The strainer and all parts of the coupling are tinned, and are furnished with all sinks without extra charge.

The fact of the great strength and durability of this sink, as it is practically free from danger of breakage in transportation, handling or use, is a strong point in its favor, and that its merits are recognized by most competent judges is evident from the fact that leading houses which have been interested in the common article have taken up the Wrought Steel Sink. Twenty-five per cent. is saved in freight by purchasing Steel Sinks. Orders come from all parts of the United States, Canada, Europe and Australia.

BRANCH WAREHOUSES:
85 and 87 JOHN STREET, NEW YORK, and 197 LAKE STREET, CHICAGO, ILL.

UNION MANUFACTURING CO.

Manufacturers of
**SKINNER'S PATENT
COMBINATION CHUCK.**
Plain and Ornamental Butts,
Single and Double Acting Spring Hinges,
Union Coil Door Springs,
Galvanized Pump Chain,
Patent Rubber Buckets,
Wooden Well Curbs, Wood Tubing,
Iron and Brass Pumps,
Patent Copper Pumps,
Hydraulic Rams, Power Pumps,
&c., &c., &c.

**FIG. 114 REPRESENTS OUR
Hand Force Pump.**
It is made of brass, is strong and light, and is the best pump of its kind in the market. Write for prices.

UNION MANUFACTURING CO.,
Warehouse, 96 Chambers St., New York. NEW BRITAIN, CONN.
GEORGE BROOKE, President. GEO. W. HARRISON, Treasurer.
THE E. & G. BROOKE IRON CO.,
BIRDSBORO, BERKS CO., PA.,
MANUFACTURERS OF

ANCHOR NAILS AND SPIKES. BRAND
Capacity, 1000 Kegs per Day.

Made from their own Pig Iron, insuring Regularity and Superiority in Quality.
ALSO
**FOUNDY AND FORGE PIG IRON,
AND COLD BLAST CHARCOAL CAR WHEEL IRON.**

OLD DOMINION
CUT NAILS, BAR IRON.
Address **R. E. BLANKENSHIP,**
RICHMOND, VA.

IRON AND STEEL DROP FORGINGS
All shapes, small and large, including
GUN, PISTOL, WRENCH BARS, &c. ALSO, DIE SINKING, MANUFACTURERS ALSO
OF BRICKLAYERS' MOULDERS' AND PLASTERERS' TOOLS,
SADDLERS' ROUND AND FLAT KNIVES,
WILLIAM ROSE & BROS.,
36th & Filbert Sts., WEST PHILADELPHIA.

NATIONAL HARDWARE & MALLEABLE IRON WORKS,
Lehigh Avenue, American and Third Streets, Philadelphia.
THOMAS DEVLIN & CO.,
MALLEABLE, FINE GRAY IRON AND STEEL CASTINGS made from patterns to
order. Special attention given to Tinning, Bronzing, Coppering, Japanning and Fitting. A large line
of Carriage and Wagon Castings constantly on hand for the trade.

BRIDGEWATER IRON CO., Bridgewater, Mass.,
Manufacturers of
**SEAMLESS DRAWN BRASS & COPPER TUBES,
CUT NAILS, HORSE NAILS, FORGINGS, &c.**
NAHUM STETSON, Jr., Agent, 73 Pearl Street, New York.

the wire between the rollers upward and thus stretches it taut.

A new method of attaching metal hubs or other cored castings to their shafts, without drilling or tapping the cast metal, has been patented by M. Garside, of Jersey City, N. J. The hub is cored out inside in the usual way and bored to fit the shaft. A nut recess is made in the hub, and communicates with the central bore. A screw hole extends through the hub from the recess to the outside. In securing the pulley on the shaft a nut is first placed into the recess and the shaft is slipped into the hub. Then a set-screw is inserted through the hole and made to engage with the nut. By turning the screw the nut is caused to press against the roof of the recess, while the end of the screw bears against and locks the shaft. The invention is intended to be applied to cored castings the form of which renders the application of a drill or tap difficult.

A furnace for burning wet fuel, such as bagasse and similar substances, has been patented by A. W. Colwell, of New York City. The combustion chamber is composed of three more or less grates, placed side by side, but at a considerable distance apart. The space between each pair of grates is taken up by standing walls which constitute upwardly-projecting triangular surfaces. The walls are grooved from their upper to their lower end. Into the lower part of the grooves currents of air or steam are forced through nozzles. The fuel is dropped on the grates and leans on the inclined wall. Air channels being produced by the grooves, the fuel will always be in contact with oxygen, which will promote combustion. The jets of air thrown into the grooves through the nozzles will still further increase the combustion. The heated gases from the fire chamber pass through a hollow arch into a channel which is located beneath the boiler.

A combustion chamber without grate-bars, applicable to all kinds of boilers, has been patented by W. L. Lowrey, of Boston, Mass. The inventor states that grates cause a great waste of heat, and that, in order to insure perfect combustion, the fuel should be heated to white heat before air is applied. The new combustion chamber consists of a horizontal tubular vessel provided with a hopper at its center. One end of the tube is closed, while the other connects with the boiler. An air-blast pipe enters the tube between its closed end and the hopper. Coal is placed into the hopper and falls into the tube, burning to a white heat, below and around the throat of the hopper. The air blast strikes the burning fuel and creates a current of heat toward the boiler. The coal is not treated with air until it has become incandescent. The heat is taken from the center of the fuel, where the most active combustion takes place, and not from the top, as is now generally done.

Continuous Automatic Brakes.

Commenting on recent failures of the automatic vacuum brake on British railways, *Nature* supplies the following, which will be read with interest:

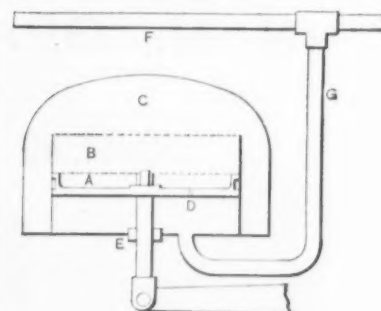
In an extract from the Board of Trade returns on continuous brakes, for the half-year ending June 30, published by the Vacuum Brake Company, we find the Westinghouse automatic credited with 397 faults for a mileage of 15,506,447. We think it may be truly stated that the Westinghouse automatic has not had fair play with some of the companies having it partially in use, its failures having been carefully reported, while any failure of their own special brake not having any serious consequences has been looked over.

The automatic vacuum brake in use on the Midland Railway has, as its name implies, the pressure of the atmosphere opposed to a partial vacuum for its motive power, the vacuum being created by means of an ejector on the engine, connected to every vehicle on the train by means of a continuous pipe, having flexible pipes and couplings between the vehicles. To maintain the vacuum throughout the train against leakage there is a small injector continually in use on the engine. Coupled to the continuous pipe on each vehicle is the automatic brake cylinder and reservoir peculiar to the Midland automatic brake, the piston being connected by means of levers and rods to the brake-blocks. The illustration gives a good idea of the general construction of the brake cylinder and its connections, the arrangement being as follows: The brake cylinder B is placed inside the reservoir C, the piston A working air-tight in the cylinder; the piston-rod passing through the bottom of the cylinder by means of a gland, E, having a flexible packing ring so arranged that when the piston is at the bottom of the cylinder it comes in contact with the packing ring, making an air-tight joint; but when the piston moves upward, leaving the packing ring, air is able to pass through the gland into the lower part of the brake cylinder. The continuous pipe F is connected by the branch pipe G to the lower part of the brake cylinder. Through the piston there is a small hole, D, called the leak-hole, this being one of the main features of the brake, the mode of action of which is as follows: A vacuum is created in the continuous pipe by means of the ejector on the engine, the air being drawn from below the pistons in the brake cylinder by the branch connections; the air in the reservoir C leaks through the leak-hole D, and after a short time there is an equal vacuum above and below the pistons. The brake is now charged and in its usual condition when the train is running, the vacuum being maintained against accidental leakage by the continual use of the small ejector.

To apply the brake, air is admitted into the continuous pipe, destroying the partial vacuum, and increasing the pressure below the pistons, causes them to rise, breaking at the same time the air-tight joint made by the piston against the packing ring, thereby admitting air direct, through the gland, into the lower part of the brake cylinder, causing the application of the brakes to be nearly instantaneous. It will be observed that, directly the piston is forced up by the atmospheric pressure, the vacuum in the reservoir will gradually be destroyed by air passing through the leak-hole—in fact, after less than

two minutes it has leaked itself entirely off. It is also evident that it cannot be instantly charged, for the vacuum in the reservoir has to be created through the leak-hole. It is stated by some that the Midland automatic vacuum answers all the Board of Trade conditions, and is therefore to be regarded as an effective, serviceable automatic brake. On studying the reports in the returns, and the failures of this brake as reported in the technical papers, we see how absurd the claim to efficiency becomes. For example, the brake cannot be applied quickly several times in succession; when applied even once, the effective brake-power has all vanished in two minutes, thus getting the doubtful name of the "two-minute leak-off brake." Again, suppose a train became divided from any cause, when ascending a heavy gradient, the brake should automatically apply itself, and remain applied until taken off by hand. What would the Midland automatic vacuum do under the above circumstances? Certainly the brake would apply itself, but in two minutes or less all the available brake-power will have vanished, and, should the hand-brake in the rear van not prove powerful enough to hold the train on the bank, it will commence to run back.

Although the Midland Company have the automatic vacuum in general use, it is no criterion that the brake is satisfactory; we have only to add that the engines and tenders are fitted with an efficient steam brake, so that in entering stations, should the automatic vacuum fail, the steam brake is quite capable of stopping the train, only taking a little further distance to pull up in. At terminal stations sometimes this is very awkward, as the accident at the Liverpool Central Station, which happened some time ago, shows. Here the automatic vacuum brake failed, and the train ran into a brake-van standing by the stop-blocks, doing considerable damage. It may be interesting to have a short account of the Westinghouse automatic pressure brake, the worst fault of which, according to its opponents, is its efficiency in stopping trains should anything go wrong with the brake apparatus. The motive-power of this brake is compressed air at a pressure of about 80 pounds to 100 pounds, compressed by an ingeniously constructed steam pump on the engine, and stored in a main reservoir under the foot plate; throughout the train runs a pipe, connected between the vehicles by means of flexible hose-pipes and couplings. On each vehicle, including



Automatic Vacuum Brake.

the engine, is placed a small reservoir, a triple valve, and a brake cylinder, with a piston connected by levers and rods to the brake-blocks. On the engine is placed the driver's brake-valve for working the brake. The whole system of this brake lies entirely in the construction and action of the triple valve. When the brake is in use, the train-pipe and small reservoirs are charged with compressed air; the air, passing through the triple valve, opens a passage between the small reservoir and the brake cylinder, thus allowing the compressed air stored to expand into the brake cylinder, forcing out the piston and applying the brake. To take the brake off, the converse happens: the pressure in the train pipe is increased, the triple valve closing the passage between the small reservoir and the brake cylinder, at the same time allowing the compressed air in the brake cylinder to exhaust into the atmosphere, the small reservoir again being charged with compressed air from the train-pipe.

The triple valve consists of a small cylinder having a piston connected on the upper side to a small slide-valve working over two ports, arranged one above the other, the lower opening direct to the atmosphere, the upper connected by a pipe to the brake cylinder. The slide-valve works in a small casing connected to the small reservoir; the triple valve is connected to the train-pipe by a pipe opening into the lower part of the cylinder in which the small piston works. When the piston is at the top of the cylinder it opens a connection between its lower and upper side, thus allowing compressed air to pass round the piston into the casing in which the slide-valve works, then into the small reservoir. When in this position the slide-valve has closed both ports to the compressed air in the casing, the port leading to the brake cylinder being open, through the valve, to the lower or exhaust port. On charging the train-pipe with compressed air it will be observed that the piston in the triple valve will be forced up, thus filling the small reservoir and triple valve with compressed air, but not the brake cylinder; also that the pressure of air on both sides of the piston in the triple valve will be equal; on reducing the air pressure in the train-pipe by a few pounds, the piston will naturally be forced down by the greater pressure on the upper side moving the slide-valve and allowing a quantity of the compressed air in the small reservoir to enter the port leading to the brake cylinder, and apply the brake. The air expanding into the brake cylinder will cause its pressure to be reduced, and, therefore, balance the piston in the triple valve. It is evident, therefore, that any small reduction of pressure in the train-pipe will cause a corresponding application of the brake, a reduction of the pressure by 25 pounds being sufficient to put the brake hard on and skid every wheel.

The function of the driver's brake-valve is to work the brake apparatus by varying the pressure of the air in the train-pipe. In the first position of the handle which works the valve, called the charging position, air

Paris, 1878.

**McCAFFREY & BRO.,**

PENNSYLVANIA FILE WORKS

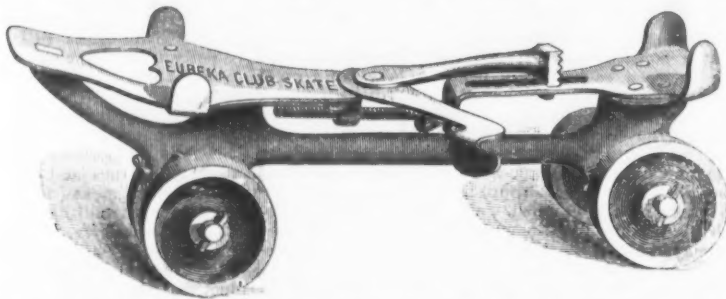
Philadelphia, Pa., U. S.

For Superiority.



Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

Superiority acknowledged wherever used, sold or exhibited.

"EUREKA" CLUB ROLLER SKATE.

The above cut represents the "EUREKA" Roller Skate, the **Most Complete** and **Most Perfect** in the Market. The clamp and foot-plates are made of Steel. **Simple, Durable and Easily Adjusted.**

When fastening this Skate to the shoe, the heel-clamps are stationary. The toe-clamps are drawn together, and the corrugated bar pressed back against the heel simultaneously by one motion of the lever, which is under the instep and cannot by any possibility be thrown out of position while skating, making a most perfect and secure adjustment to the shoe.

LIST, \$7.00. SPECIAL DISCOUNT TO THE TRADE.

MANUFACTURED BY P. LOWENTRAUT.

ADDRESS

JOHN H. GRAHAM & CO.,

General Agents, 113 Chambers St., New York City.

LIGHTNING HAY KNIVES. WEYMOUTH'S PATENT.

This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bales, cutting corn stalks for feed, cutting peat and ditching marshes.

The blade is best cast steel, spring temper, easily sharpened, and giving universal satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and it seems destined to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each of 50 pounds weight, suitable for shipping by land or water to any part of the world.

MANUFACTURED ONLY BY

HIRAM HOLT & CO., East Wilton, Franklin Co., Maine.
For sale by the Hardware trade generally.

CAUTION:

We are informed that various parties are infringing upon the widely known Letters Patent granted originally to George F. Weymouth, for an improved Hay Knife.

The characteristic feature of the invention is a curved blade, provided with saw-tooth cutters, and furnished with suitable working handles. It is our purpose to prosecute all infringers of our patent, and we have already commenced one suit, which is nearly ready for hearing, and are about commencing suits against other parties.

All manufacturers are hereby warned of our rights, and the public are cautioned against purchasing any Hay "Saw Knives" which are not of our genuine manufacture.

HIRAM HOLT & CO.
EAST WILTON, May 26, 1884.

J. M. STUTZMAN,

181 William Street, NEW YORK.

STEEL NAME STAMPS.

Steel Alphabets,

Die Letters for Seal Engravers.

BRANDS, SEALS,

POST-OFFICE STAMPS,

Door Plates.

Steel Stencil-Cutting Dies, Soap Moulds and Brass Stamps.

SEND FOR PRICE LIST.

LION BRAND

West Side Galvanizing Works,
585 to 547 W. 15th ST., NEW YORK CITY.**JOHN MERRY & CO.**

Manufacturers and Sole Proprietors of the

above well-known Brands of

GALVANIZED SHEET IRON

CORRUGATED IRON FOR ROOFING OR SIDING; SLATING AND ROOFING NAILS, Tinned, Galvanized or Black; TIN PLATES, SHEET ZINC, SOLDER, &c.

Would also call attention to our unequalled facilities for GALVANIZING OR TINNING. All kinds of Wrought, Cast or Sheet Iron Work.

GARRY IRON ROOFING COMPANY

Largest manufacturers of Iron

Roofing in the world. Manufacturers of all kinds of

IRON ROOFING

Crimped and Corrugated Siding, Iron Tile or Shingle, Fire-Proof Doors, Shutters, &c.

**IRON ORE PAINT AND CEMENT.**

153-155 MERWIN STREET

CLEVELAND, O.

Send for Circular and Price List No. 15.

Steel Carpet Tacks.

6, 8, 10, 12, 14, 16, oz. } 37½ cts. per doz. for Bright or Blued.
50 } 50 " " " Tinned or Coppered.
Discounts, 50, 10 and 2 per cent. for Cash.

BOSTON SALESROOM, 79 Portland St. BALTIMORE SALESROOM, 73 German St. NEW YORK SALESROOM, 116 Chambers St.

American Tack Co., Fairhaven, Mass.**Nicholson FILES.**

Bandsaw Files,
Boot Heel,
Brass,
Cabinet,
Cant,
Cotter Taper,
Cotter Equaling,
Cross or Crossing,
Doctor,
Drill,
Feather Edge,
Finishing,
Flat,
Flat Equaling,
Flat Wood,
Gang-Edger,
Ginsaw,
Gulleting,
Half-Round,
Half-Round Wood,
Hand,
Hand Equaling,
Handsaw Blunt,
Handsaw (Double-End),
Handsaw Taper, single-cut,
Handsaw Taper, double-cut,
Handsaw Taper, slim,
High Back,
Hook-Tooth,
Knife,
Knife Blunt,
Lead Float,
Lightning,
Machine Mill,
Mill,
Mill Blunt,
Mill Pointing,
Pillar,
Pitsaw,
Reaper,
Roller,
Round,
Round Blunt,
Slotting,
Slim Handsaw Taper,
Square,
Square Blunt,
Square Equaling Files,
Stave Saw,
Three-Square Files,
Three-Square Blunt Files,
Tumbler Files,
Union Cut,
Warding Files,
Warding Blunt File,
Warding Round Edge File.

RASPS.

Baker's
Beveled Edge,
Bread,
Cabinet,
File, Flat and Half-Round,
Flat Shoe,
Flat Wood,
Half-Round Shoe,
Half-Round Wood,
Horse, Plain and Tanged,
Horse Mouth,
Jig,
Oval or French Shoe,
Racer, Plain and Tanged.

SPECIALTIES.

Butchers' Steels, Improved,
Bent Riffles, Handled,
File Cards,
File Brushes,
Machinists' Scrapers,
Stub Files & Holder, Detachable,
Surface File Holder,
Vise File Holder.

NICHOLSON**FILE CO.,**

PROVIDENCE,

R. I.,

SOLE MANUFACTURERS.

BLACK DIAMOND FILE WORKS.

TRADE MARK.



G. & H. Barnett, 21 to 43 Richmond St., Philadelphia.

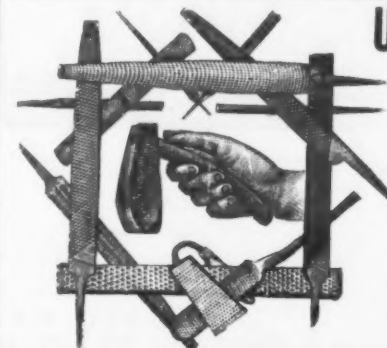
CHARLES B. PAUL, MANUFACTURER OF HAND CUT FILES,

Warranted Cast Steel.

187 Tenth St., Williamsburgh, N. Y.

All descriptions of Files made to order. Price List mailed on application.

Established 1863.

**UNION FILE COMPANY,**

309 to 315 North Street.

BALTIMORE, MD.,

Manufacturers of

FILES AND RASPS

Made from the Best Refined Cast Steel.

In offering our goods we guarantee to give satisfaction, each File being thoroughly examined at every stage of manufacture and tested by an expert before leaving the works.

We are continually increasing our facilities and are prepared to fill orders promptly.

THRIFT FILE WORKS,

Manufacturers of all kinds of

Files, Rasps.

CHRISTIAN HENSSELER,
428, 430, 432 & 434 Ireland St., PHILA., PA.
HERING & SWEASEY, Agents in New York, 102 Chambers St.

CUN POWDER.**Laffin & Rand Powder Co.,**

No. 29 Murray Street, New York.

Manufacture and sell the following celebrated brands of Sporting Powder known everywhere as

ORANGE LIGHTNING,**ORANGE DUCKING,****ORANGE RIFLE,**

more popular than any Powder now in use.

Blasting Powder and Electrical Blasting Apparatus.**Military Powder** on hand and made to order.**SAFETY FUSE, FRICTIONAL & PLATINUM FUSES.**

Pamphlets showing sizes of grain sent free.

The Patent Combined

Dinner Pail and**Lantern.**

The most perfect Dinner Pail in the world. Hot coffee for dinner and a Lantern at night.

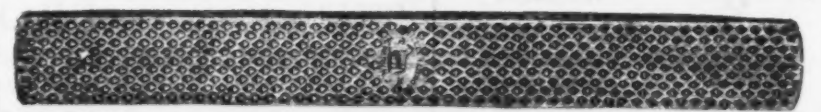
Manufactured by J. H. HAIGHT, PORT CHESTER, N. Y.

Sent by express on receipt of \$1.00. Agents wanted.

HELLER & BROS., Newark, N. J.,

Manufacturers of the

Celebrated American

HORSE RASPS AND FILES,

Made of solid best CLAY CRUCIBLE CAST STEEL of our own manufacture, and warranted to be unequalled in the market. For sale by Iron and Hardware dealers throughout the United States and Canada.

**J. M. KING & CO.,**

WATERFORD, N. Y.,

Manufacturers of the

Button's Pat. Wire Cutter and Plier Combined.

Specially Adapted for Use on Wire Fence.

Also Manufacturers of BLACKSMITHS' and MACHINISTS' STOCKS and DIES, PLUG and TAPER TAPS, HAND, NUT and SCREW TAPS, PIPE TAPS and REAMERS.

Price List on Application.

Established by DANIEL B. KING, 1859.

LIGGETT SPRING AND AXLE CO., LIMITED,

MANUFACTURERS OF

Springs and Axles

For Coaches, Phaetons, Buggies, Wagons, &c

PITTSBURGH, PA.

M. BARE, HAMILTON, OHIO,

MANUFACTURES

Solid Eye Planters' Hoes,

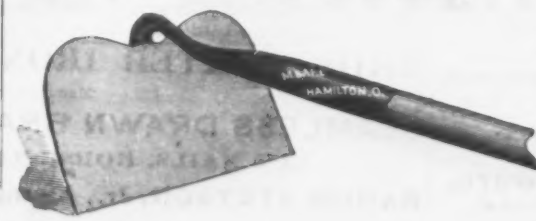
German Handled Hoes,

Socket and Shank Planters' Hoes,

Steel and Malleable Iron Rakes.

CORRESPONDENCE RESPECTFULLY SOLICITED.

Catalogues Furnished on Application.



John Chatillon & Sons,
91 & 93 CLIFF ST., NEW YORK.



Manufacturers of
SPRING BALANCES
Patent Balances,
UNION AND COUNTER
SCALES,
SPIRAL SPRINGS,
Send for Illustrated Price List.

WILDE'S PATENT
Expanding Mandrel
IS THE MOST PERFECT NOVELTY OUT.
Simple, Inexpensive, Accurate.

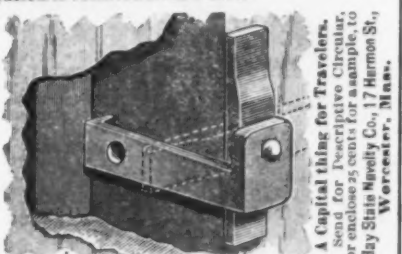


COOKE & CO.,
23 Cortlandt Street, NEW YORK.
Sales Agents and Dealers in
GENERAL MACHINERY AND SUPPLIES
FOR
Manufacturers, Mills, Mines, Railroads
and Steamships.
Engines, Boilers, Pumps, Blowers, &c.
Write for circular and mention this paper.



JUST PUBLISHED,
1884-FALL CATALOGUE-1884
OF BOOKS ON
Architecture, Building, Carpentry,
Painting and Decoration.
NOW READY.
New Catalogue of Drawing Instruments, Drawing Papers,
Architects' and Engineers' Materials.
Either of both these catalogues will be sent free to
those mentioning this paper.
WM. T. COMSTOCK, Publisher,
NEW YORK, 6 ASTOR PLACE.
Please send for special rates to Hardware dealers.

LITTLE GIANT DOOR FASTENER.
The best article in use for a pocket door fastener. It is a simple contrivance, instantly adjusted or removed from a door.

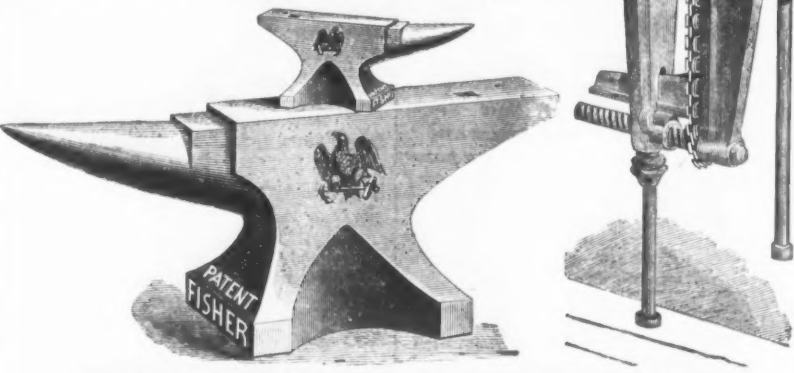


P.W. Gallaudet
Cor. Broadway and Wall St., New York.
Bankers and dealers in COMMERCIAL PAPER.
Stocks and Bonds dealt in for cash or on margin at
New York Stock Exchange.

GEORGE W. BRUCE,
1 Platt St., New York, Proprietor of the
ATLANTIC SCREW WORKS,
Agent for the
Florence Tack Co. and
C. A. Maynard,
MAYNARD'S C. S. Planters',
Hilling, Bog and Handled
Planters, Cotton and Field
Hoes.
BRADY'S Crown, Planters'
and Hilling.
ELWELL'S Weeding, Planters'
and grub, and a variety
of other kinds for Home
and Export Trade.

ESTERBROOK'S STEEL
PENS
Leading Numbers: 14, 048, 130, 333, 161.
For Sale by all Stationers.
THE ESTERBROOK STEEL PEN CO.
Works, Camden, N. J. 20 John St., New York.

ESTABLISHED 1843.
MORE THAN 200 DIFFERENT PATTERNS.
None Genuine without our Trade-Mark,
EAGLE and "FISHER" Stamp.

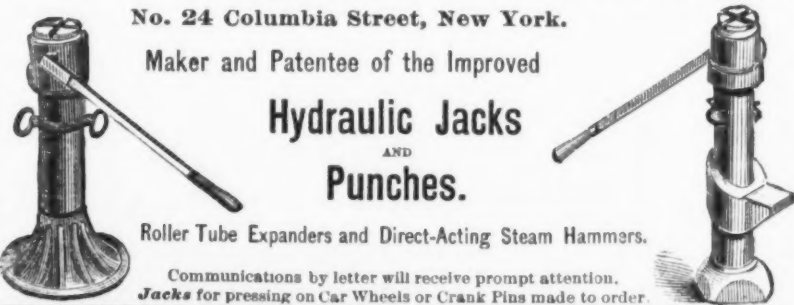


WARRANTED BETTER THAN THE BEST ENGLISH ANVIL
Face in one piece of BEST TOOL CAST STEEL, PERFECTLY WELDED, perfectly
true, of hardest temper, and never to come off or "settle." Horn of tough untempered
steel, never to break or bend. Only Anvil made in United States fully warranted as
above.

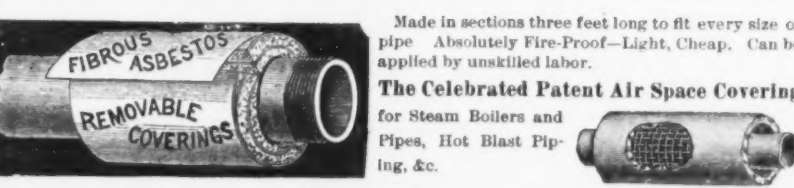
FISHER DOUBLE-SCREW VISE
IS FULLY WARRANTED STRONGER THAN ANY OTHER LEG VISE, AND
ALWAYS PARALLEL. Is the best Vise for Machine Shops and Blacksmiths, and for
all heavy work. ACCURATE AND DURABLE. Send for Circular.

EAGLE ANVIL WORKS,
TRENTON, N. J.

RICHARD DUDGEON,



COVERINGS.
Made in sections three feet long to fit every size of
pipe. Absolutely Fire-Proof—Light, Cheap. Can be
applied by unskilled labor.
The Celebrated Patent Air Space Covering
for Steam Boilers and
Pipes, Hot Blast Pip-
ing, &c.



Asbestos Materials, Fibre, Millboard Packing and Cement.
Address
CHALMERS-SPENCE CO.,
113 FIRST AVE., PITTSBURGH, PA. 419 & 421 EIGHTH ST., NEW YORK.

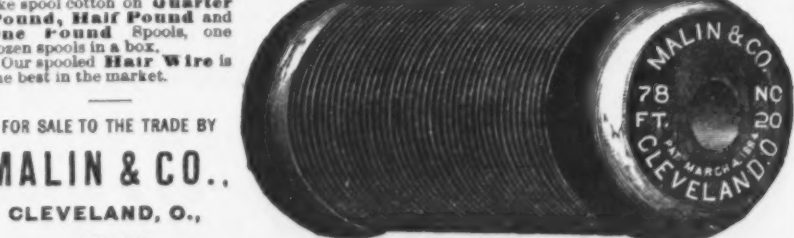
THE ESSEX HORSE NAIL CO., LIMITED,
OFFICES:
ESSEX, ESSEX CO., NEW YORK,
100 Chambers St., NEW YORK CITY.

The Essex Horse Nails
Are drawn from the best Swedes Iron Rods only. They are hot-forged and cold-pointed,
rendering them tough, stiff and easy driving, and are warranted
FIRST-CLASS IN EVERY RESPECT.
All Nails branded "ESSEX" are Fully Guaranteed.

Stanley Rule and Level Company,
MANUFACTURERS OF
IMPROVED
CARPENTERS' TOOLS.
Factories:
NEW BRITAIN,
CONN.
Warehouses:
29 Chambers Street,
NEW YORK.
No. 78, Iron Stock and Fence, 8 1/2 in. in length, 1 1/2 in. Cutter, \$1.50.

MALIN & CO., CLEVELAND, OHIO.
Dealers in Steel, Copper, Brass, Tin Plated and Copper Plated Wire,
Manufacturers of BESSEMER STEEL WASHERS.

PATENT SPOOL WIRE FOR THE RETAIL HARDWARE TRADE.
Dealers who handle it do away with the Broken Bundle Business and sell small quanti-
ties by the spool only. It is a convenience for both dealer and consumer. It is Shellac-Coated
and cannot rust; it is wound
like spool cotton on quarter
pound, half pound and
one pound spools, one
dozen spools in a box.
Our spooled Hair Wire is
the best in the market.



FOR SALE TO THE TRADE BY
MALIN & CO.,
CLEVELAND, O.,
AND BY
Hardware Jobbers Everywhere.
SEND FOR ILLUSTRATED PRICE LIST.
SPECIAL WIRES FOR MANUFACTURING PURPOSES ON ANY SIZE OF SPOOL.
JOHN WALES & CO., 239 and 241 Franklin St. BOSTON, MASS.
Manufacturers and the Trade are warned not to infringe on our patent, No. 294,720, either by manufacturing
or selling.

from the main reservoir is able to go direct
to the train-pipe, to charge or release the
brake. On moving the handle through an
angle of a few degrees into the feed position,
the connection between the main reservoir
and the train-pipe is closed, the compressed
air having to pass through a pressure-reduc-
ing valve on its way to the train-pipe from
the main reservoir to make up for any slight
leakage which may occur. It is important
that the pressure of the air in the main re-
servoir should always be about 15 pounds
above that in the train-pipe, so that, when
the brakes are being released, by increasing
the pressure in the train-pipe direct from
the main reservoir the triple valves are
certain to act on account of the extra
15 pounds pressure in the train-pipe above
the pressure in the small reservoirs.
On moving the handle of the driver's valve
further in the same direction, or into the
position for applying the brakes, all con-
nection between the main reservoir and the
train-pipe is cut off, at the same time that
the train-pipe is put in connection with the
atmosphere, through an exhaust port; by
this means the pressure in the train-pipe can
be reduced to any degree to apply the brake.
All brake cylinders on vehicles are fitted
with a release-valve, so that, should the
brake be applied when the engine is not at-
tached, the air can be discharged from the
brake cylinder, through the release-valve,
by pulling a wire attached to the valve.
All vehicles now fitted with this brake
have cocks at each end of the train-pipe, so
that, should any change have to be made in
the train, the coupling or uncoupling of ve-
hicles is easily accomplished without the
brake automatically applying itself. It is
easy to see that this brake is automatic in its
action, for, should the train-pipe or flexible
couplings be injured by accident, or the
train part into two or more portions, the
compressed air will escape from the train-
pipe and the brake will apply itself.

NEW PUBLICATIONS.

**HISTORY OF THE MANUFACTURE OF IRON IN ALL
AGES, AND PARTICULARLY IN THE UNITED STATES
FOR 300 YEARS, FROM 1585 TO 1885.** By JAMES M.
SWANK, Secretary of the American Iron and Steel
Association, Member of the Historical Society of
Pennsylvania. Philadelphia: published by the
author, No. 261 South Fourth street, 1884. Cloth,
428 pages, octavo.

The members of the American iron trade
are familiar with Mr. Swank's literary work
in the form of the weekly *Bulletin*, annual
reports and other publications of the Ameri-
can Iron and Steel Association, of which he
has been secretary for the past 12 years.
During that time he has devoted much atten-
tion to historical matters connected with the
development of the American iron trade, and
he has rendered valuable service in rescuing
from oblivion and recording in imperishable
shape the facts connected with the establish-
ment of the manufacture of iron and steel in
this country. His "Centennial Report,"
issued in 1876, while the Philadelphia exhi-
bition was in progress, was his first im-
portant effort in the direction of historical
research in connection with the iron trade.
This was followed in 1878 by a volume called
"Iron-making and Coal Mining in Pennsyl-
vania," in which he presented in greater de-
tail the steps by which that great State ad-
vanced from a very humble beginning to its
present proud position as the leading State in
the Union in the manufacture of iron and
steel and the mining of coal. In 1880 he
widened his field of research and contributed
a comprehensive historical report in con-
nection with elaborate statistics to the Census
Office, having been appointed special agent
to collect the statistics of iron and steel by
Gen. Francis A. Walker, the Superintendent
of the Census. Mr. Swank's fidelity to his
self-appointed task as historian of the Ameri-
can iron trade and his untiring devotion to
this purpose are shown also in related con-
tributions in other directions, which were
made contemporaneously. With the expe-
rience thus acquired and the knowledge
gained, he has engaged in a more ambitious
undertaking, the results of which are em-
bodied in the admirable work of which we
give the title above.

In the preparation of this volume it has
been Mr. Swank's aim to record historical
facts rather than to chronicle technical
progress, although sufficient attention has
been paid to the latter phase of his sub-
ject to make the book a complete repository
of the details essential to a perfect under-
standing of the remarkable success achieved
in the manufacture of iron and steel in the
United States. The opening chapters are
devoted to a presentation of such details as
are now available of the use of iron in the
earliest ages of antiquity. The author pre-
sents in compact form a wealth of quotations
from the Old Testament and from ancient
historians relative to the knowledge of iron
and steel by the most ancient people of
whom we possess any record, the state-
ments of the writers of those early days
being supported and strengthened by the
discoveries of modern antiquarians. From
the evidences of the use of iron and steel
in very remote times in Asia and Africa,
Mr. Swank passes to the early use of iron
in Europe, drawing much information from
classical writers relative to this subject.
The growth of the British iron industry
naturally becomes a topic of leading im-
portance, and a very interesting chapter is
devoted to it. Within a comparatively brief
space are recorded all the principal achieve-
ments by British metallurgists which have
elevated their country to its pre-eminence
among the nations of the world. Early
processes in the manufacture of iron and
medieval and early modern processes re-
ceive careful attention, the successive steps
from primitive methods to those of a more
advanced character being detailed with an
elaboration which is never tiresome, but
which demonstrates very satisfactorily the
gradual development of the art of manufac-
turing iron and steel.

Having shown the condition of the iron
trade of the world up to the settlement of
America, Mr. Swank proceeds to describe
the first attempts by Europeans to manu-
facture iron on this side of the Atlantic.
Although up to this point the author has evi-
dently sought most diligently for informa-
tion, with rich results, his succeeding chap-
ters treating of the development of the
American iron trade very naturally exhibit

much greater wealth of details and vastly
more information, drawn from original
sources. Every section of the Union is
treated with the importance which its posi-
tion in the iron trade deserves. Mr. Swank
has labored with untiring zeal to ascertain
authentically the facts connected with the
beginning of the manufacture of iron in
every State and in every locality, as far as
possible, and his success in this respect is
marvelous. The connection of distinguished
personages in American history with the
iron trade is a very interesting feature of
the work, the introduction of such personal
references serving to enliven an otherwise
tedious grouping of facts and dates, though
Mr. Swank's literary skill often invests the
driest subjects with even dramatic force.
Separate chapters are devoted to the manu-
facture of iron with anthracite coal, with
bituminous coal, of Bessemer steel and of
open-hearth steel, in every case fresh infor-
mation being added to what is commonly
known in connection with these matters. A
variety of miscellaneous facts connected
with the manufacture of iron and steel is
given, such as the first use of the hot-blast
in this country, the first use of fire-brick
stoves, the introduction of the use of escap-
ing gases from the blast furnace, the devel-
opment of the blowing engine into the pow-
erful machinery now used, the introduction
of natural gas as an iron-making fuel, the
use of wood in the early puddling furnaces,
the beginning of the manufacture of coke
in the famous Connellsville district, the in-
vention of the wrought-iron column, the
erection of steam boilers over puddling and
heating furnaces, and a record of some of
the most remarkable achievements in the
production of large quantities or great masses
of iron and steel by American works. The
early history of the manufacture of iron
rails and the development of iron shipbuild-
ing in the United States receive careful
treatment.

Mr. Swank devotes some space to the diffi-
culties encountered in the establishment of
the manufacture of iron and steel in this
country, notably the impediments thrown in
the way of our pioneers by the repressive
legislation of Great Britain, both during the
colonial period and after we had secured our
political independence. The chapters relat-
ing to this subject are exceedingly interest-
ing and instructive. Present impediments
to the cheap production of iron and steel in
the United States are briefly touched upon.
A very full chapter of statistics forms a
valuable part of the work, presenting in
compact form a complete review of the
manufacture of iron and steel in this country
from the beginning of the present century
down to 1883. A chapter on some of the
important uses of iron and steel in the
United States will be found very interesting,
even by those who suppose themselves thor-
oughly informed upon this subject. In his
concluding chapter Mr. Swank succinctly
records the position now held by the United
States among the countries manufacturing
iron and steel. He says: "We are to-day
the second iron-making and steel-making
country in the world. In a little while we
shall surpass even Great Britain in the pro-
duction of steel of all kinds, and we are
destined eventually to surpass her in the
production of pig iron." May Mr. Swank
live to see the fulfillment of his prophecy!

THE PASSENGER POOL AND A CLEARING HOUSE. By
S. F. PIERSON. Size, 8 1/2 x 6 inches, 10 pages,
pamphlet edition. Published by the *Railway*
Review.

This pamphlet, which is one of the series
of reprinted articles from the *Railway Re-
view* on railroads and their management,
deals with the important question of pooling
as applied to passenger traffic. As is very
natural, since Mr. Pierson is vice-chairman
of the joint executive committee in charge
of passenger department, he treats the
subject from the railroad point of view,
and shows the many advantages that would
accrue to the railroads from the adoption of
such a system of pooling as he suggests;
whether the public would derive equal bene-
fits from this arrangement is by many,
and perhaps with good reason, considered
doubtful. But however this may be, Mr.
Pierson's article contains a large amount of
useful information on railroad pooling. Be-
ginning with a rehearsal of the evils arising
from excessive and consequently destructive
competition, the pamphlet continues with a
general description of a comprehensive sys-
tem of passenger-traffic pooling, and closes
with a plan for a clearing house through
which the settlements would be made and the
balances paid to the different railroads in
the pool, as suggested by the present sys-
tem in Great Britain. Accepting the advan-
tages of railroad pools the necessity of some
efficient system of regulating awards is evi-
dent, and the clearing-house plan, above all
others yet proposed, appears to be the best
system for obtaining the end desired.

**REPORT OF THE UNITED STATES COMMISSION OF
FISH AND FISHERIES FOR 1882.** By J. B. BAIRD,
Commissioner. Size 9 x 6 inches, 101 pages.
Published by the Government Printing Office.

The report proper, divided into sections
entitled "Inquiry into the Decrease of Food
Fishes," and "The Propagation of Food
Fishes in the Waters of the United States,"
is contained in less than 100 pages, by far
the greater portion of the book, as was the
case in the report published last year, being
devoted to the appendix. The appendix
consists of 44 special treatises by different
writers, on subjects intimately connected
with fish and fisheries. The articles contain
a vast amount of information alike interest-
ing and instructive to the general reader,
but more particularly of value to all who are
interested in the fishing industries.

The demands of the Pittsburgh iron and
glass manufacturers have been granted by the
Transcontinental Freight Association, and an-
nounced in the rates from Pittsburgh to points
in California. The rate on bar iron has been
reduced from \$1.50 per cwt. to \$1.15; cast
steel from \$2.70 to \$1.35; common glassware
and lamp chimneys from \$2.50 to \$1.35, and
fancy glassware from \$3.62 to \$2.50. The
announcement has caused great satisfaction
in business circles in Pittsburgh.

INFRINGEMENT OF JOHN WILSON'S TRADE MARK, MASSACHUSETTS, U.S.A.

JOHN WILSON'S
BUTCHERS' KNIVES,
BUTCHERS' STEELS,
and
SHOE KNIVES.
TRADE MARK



REGISTERED IN ENGLAND,
WASHINGTON, U.S.A.
AUSTRALIAN & OTHER
BRITISH COLONIES, &
GERMANY.

ACKNOWLEDGMENT AND AGREEMENT.
"WHEREAS, I, GEORGE A. ROBINSON, of West Mansfield, County of Bristol, State of Massachusetts, have heretofore manufactured and sold certain Knives bearing a Mark which is claimed to be an imitation of the trade-mark owned by John Wilson, of Sheffield, England, which consists of four peppercorns and a diamond, under the mistaken belief that I had the right to do so.
NOW, This, is to Witness, that, in consideration of the forbearance of the Representatives of the said John Wilson to sue me for damages for the wrong aforesaid, I do hereby undertake and agree,
FIRST, to surrender and deliver to the Attorneys for the said John Wilson, all knives now on hand, and in my possession, or under my control, bearing the said imitation trade-mark, and
SECOND, I further undertake and agree to and with the said John Wilson, and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid, or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereunto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1885.

WITNESSES:
E. M. REED,
(Attorney for Defendant.)

G. A. ROBINSON. (L.S.)

Imitation of J. WILSON'S MARK.

WORKS:—SYCAMORE ST., SHEFFIELD, ENGLAND. Established 1750.

AMERICAN MADE RAZORS



J. R. TORREY,
MANUFACTURER OF
Strops and Dressing Cases.
IMPORTER OF FINE RAZOR HONES.
Wholesale Dealer in Cutlery.

J. R. TORREY RAZOR CO.,
MANUFACTURERS OF
Razors in all Styles.

FACTORY AT WORCESTER, MASS.
We make the largest and most complete line of Razor Strops ever offered to the trade, including every description and style known. Our Razors are the Standard for excellent cutting quality and elegance of finish, and our prices lower than foreign makes of similar grade. Our Toilet Sets and Dressing Cases are designed for practical use and are made in various attractive styles.
Send for Illustrated Price List—free to the Trade.

UNDERHILL, CLINCH & CO.,

94 Chambers Street, New York.

DEPOT FOR

W. & S. Butcher's Edge Tools.

Nicholson File Co.'s Files.
Russell Jennings' Auger Bits.
Geo. Selsor & Co.'s Hatchets, Hammers, &c.
American Screw Co.'s Wood, Machine and Nail
Screws, Store and Tire Bolts, Rivets, &c.

Brade's Brick Trowels.
O. Ames & Son's Shovels, Spades and Scoops.
E. W. Gilmore & Co.'s Strap and T. Hinges.
A. Field & Son's Tacks, Brads, Nails, &c.

GENERAL HARDWARE.

FORBES'

PATENT ACME CLUB SKATE.

The Original and Only Acme Ice Skate.

MANUFACTURED BY

THE STARR MANUFACTURING COMPANY, HALIFAX.

DAME, STODDARD & KENDALL,

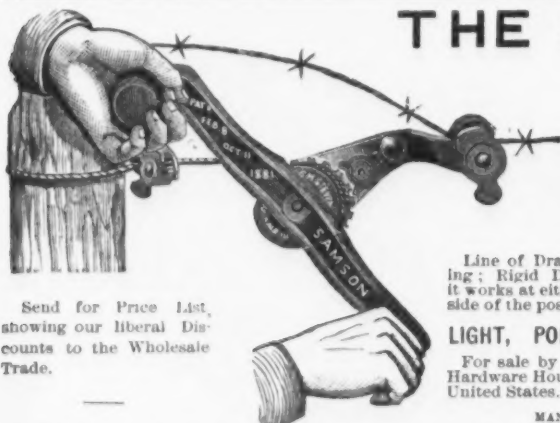
Successors to BRADFORD & ANTHONY, Boston, Mass.,



Universally Acknowledged the Best Self-Fastening Skate Ever Invented.

RETAINS THE FIRST PLACE AND FOREMOST RANK FOR DEMONSTRATED SUPERIORITY.

The same standard of excellence of quality and finish will be maintained in the manufacture of these Skates. We feel confident that an inspection will convince that the Forbes' Acme Skates are superior in quality and finish to any imitation patterns. We have largely reduced our prices from those of last year. Send for Catalogue and Prices.



THE SAMSON

Is the Best, the Simple and most Portable

WIRE STRETCHER

in the Market.

Line of Draft direct; always Self-Adjusting; Rigid Double Handle; Double Pawl; it works at either end of the fence, at either side of the post and either side up.

LIGHT, PORTABLE, SIMPLE, SURE.

For sale by all leading wholesale Jobbing Hardware Houses and Barb Wire men in the United States.

MANUFACTURED ONLY BY

SAMSON NOVELTY WORKS, Nos. 14 & 16 Main St., De Kalb, Ills.

AND IN CANADA BY

BULLOCK HARDWARE CO., Otterville, Ontario.

THE GLAMORGAN CO.,

Founders and Machinists, LYNCHBURG, VA., Manufacturers of

Heavy and Light Machinery,

Iron and Brass Castings, Engines, Boilers, Flouring, Saw and Sumac Mill Machinery. Special and prompt attention given to Blast Furnace, Mining and Tobacco Machinery, Hydraulic Tobacco Presses, Box Screw Presses, Hoghead Presses, Hydraulic, Steam and Hand Pumps, Steam Locomotive Kettles, Hydraulic Cocks and Connections, Steam Fittings and Fixtures of all kinds for Tobacco Factories.

Double Acting Spring

BUTTS

SABIN'S LEVER DOOR SPRINGS, Coil, and Sabin's Volute Springs For various purposes made to order.

SABIN MACHINE CO., Montpelier, Vt

CORPORATE MARK.



Joseph Rodgers & Sons'
(LIMITED)

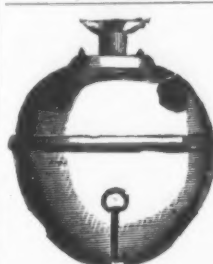
CELEBRATED CUTLERY,

No. 82 Chambers Street, New York.

F. & W. CLATWORTHY, Agents.

The demand for Joseph Rodgers & Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam-power.

To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please to see that they bear their Corporate Mark.



Established 1838.

Bevin Bros. Mfg. Co.,

Easthampton, Ct.

Manufacturers of

SLEIGH BELLS,

House, Tea, Hand,

Gong Bells, &c.

Bell Metal Kettles.



JOHN WIGFALL & CO.,

Manufacturers of Every Description of

TABLE CUTLERY,

Bread & Butchers' Knives & Steels

CORPORATE MARK: "BONA-FIDE."

Aukland Works, Sheffield, England.

SEND FOR ILLUSTRATED CATALOGUE TO

J. CURLEY & BROTHER,

SOLE AGENTS FOR THE UNITED STATES.

ALSO IMPORTERS OF THE FOLLOWING GOODS:

* +	X L	X. C. D.
JOSEPH RODGERS & SONS,	GEO. WOSTENHOLM & SON,	WADE & BUTCHER'S
Pocket & Table Cutlery, Razors & Scissors.	Pocket Knives & Razors.	Razors.
CHESTERMAN'S	"BENGALL" and JOHNSON'S	SABATIER
Measuring Tapes.	Razors.	French Cook's Knives.
Agents for HUDSON CUTLERY CO., Solingen, Germany.		
GUERRE FILS,	JOHN CLARKE & SON, Sheffield,	"SCHNEIDER" KNIVES,
French Scissors, Knives.	Razors.	Genève.

Cutlery in Every Variety of Foreign and Domestic Manufacture.

J. CURLEY & BROTHER,

134 & 136 Nassau and 11 & 13 Beekman Streets,

P. O. BOX 2169.

NEW YORK.

GUNS,

Breech and Muzzle Loading Guns; also cheap grade Revolvers. Send for quotations.

WM. P. SCOTT, Agent.

Late JOHN W. HUTCHINSON.

81 CHAMBERS STREET, NEW YORK.

P. LOWENTRAUT,

SOLE MANUFACTURER OF THE

EUREKA CLUB SKATE.



(Patented April 10, 1881.)

ALSO MANUFACTURER OF

Mechanics' Tools. General Hardware. Light and Heavy Steel Ladles a Specialty. House Furnishing Goods and Shoemakers' Tools.

276, 278, 280, 282 Halsey St., Newark, N. J.

John H. Graham & Co., General Agents,

113 CHAMBERS STREET, NEW YORK.

TWO NEW PATTERNS OF ROLLER SKATES

Will be ready for the Market by January 1, 1885. Also New Sidewalk Skate.

J. E. QUACKENBUSH & SON
MANUFACTURERS OF
Porcelain, Mineral & Jet Knobs & Escutcheons.
Send for Price List and Terms. 535 N. 4th St., N. Y.



ESTABLISHED 1836.

ALFRED FIELD & CO.,

93 Chambers and 75 Reade Streets,

NEW YORK,

SOLE AGENTS FOR

Ely Bros., Caps, Wads, &c.,
Joseph Elliot & Sons, Razors,
Isaac Greaves, Sheep Shears, &c.,
Robert Sorby & Sons, Sheep Shears, &c.,
Edward Elwell, Hoes, &c.,
R. & J. Linacre, Grass Hooks and Sickles,
Webster & Horsfall Steel Wire,
GENERAL AGENTS

Western File Co.'s American Files.

HEADQUARTERS FOR

ANVILS CHAIN CUTLERY, GUNS,
&c. &c. &c.

ROEBUCK'S PATENT

WOOD AND RUBBER

WEATHER STRIPS.

S. ROEBUCK, Sole Manufacturer,
164 Fulton Street, NEW YORK.

A. G. COES
PAT. DEC. 26, 1871.

Established in 1839.

A. G. COES & CO.

WORCESTER,

MASS.

CONSENTS TO

L. & A. G. Coes,

Manufacturers of

THE GENUINE

COES

Screw

Wrenches.

PATENTED,

May 9, 1871.

December 26, 1871.

December 28, 1878

August 1, 1876.

The backtrain when the wrench is used is borne by the bar—not by the handle. The strongest Wrench made, and the only successful Re-enforced Bar. None genuine unless stamped

A. G. COES & CO.

Our Agents, JOHN H. GRAHAM CO., 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at factory prices.

HILL'S

Eureka Dryer.

THE BEST

In the Market

For Indoor Use.

Also Manufacturers of

HILL'S

CHAMPION DRYER.

For illustration see last Iron

Age. Circulars and discounts

to the trade on application.

HILL DRYER CO.,

Worcester, Mass.

PATENT APPLIED FOR.

LEAVENWORTH'S

"ROYAL" ROLLER SKATE



Is made stronger, of better material, better finished, and will outwear any other skate on the market. The most economical for Rinks, on account of its durability and few repairs. For sale by all First-Class dealers in this line. Manufactured by F. H. Leavenworth & Co., Detroit, Mich. Manufacturers of Hardware Specialties.

GEO. BURNHAM & Co.,

Worcester, Mass.,

Successors to

E. J. Worcester Drill Co.,

Manufacturers of

BLACKSMITHS'

UPRIGHT

Self-Feeding DRILLS

HAND OR POWER.

Patented March 20, 1883.

Superior Design. Unrivalled Work-

manship. Latest Improvements.

Send for Illustrated Price List.



(Raised Letter Tool.)

THOMAS J. ANDRESS,

Manufacturer of Glass Cutters

821 Cherry Street, PHILADELPHIA, PA.

Every Address Tool Warranted.

CHAS. E. LITTLE.

59 FULTON STREET, NEW YORK.

AGENCY FOR

Barnes' Foot-Power Machinery

AND

Shipman's Steam Engines,

And the following Specialties: Coopers' and Slaters' Tools, Solid Cast Steel Pump Augers and Reamers.

HALL & ELTON'S GERMAN SILVER.



In addition to Spoons of this well-known brand, we are now prepared to furnish Forks of the same quality. We GUARANTEE these goods to be SOLID and of UNIFORM quality throughout, with no coatings to wear through or flake off, and with no liability to RUST.

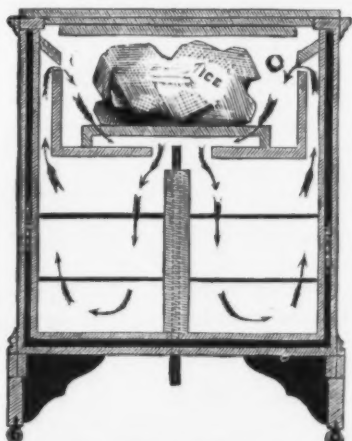
HALL, ELTON & CO. Wallingford, Conn., and 47 East 13th St., New York.

THE DELUSION MOUSE TRAP.



The Mouse goes in to get the bait And shuts the door by his own weight, And then he jumps right through a hole And thinks he's out; but, bless his soul He's in a cage, somehow or other, And sets the trap to catch another.

MANUFACTURED EXCLUSIVELY BY THE
LOVELL MFG. CO., LIMITED,
ERIE, PA.



GEO. N. PIERCE & CO.,
BUFFALO, N. Y.,
New York Office, - 195 Water Street.

MANUFACTURERS OF
BIRD CAGES and REFRIGERATORS.

Send for Illustrated Catalogue and Price Lists
ALSO FOR SALE BY
Chicago Stamping Co., Chicago, Ill.
Bickles, Preston & Co., Davenport, Iowa.
Cincinnati Tin and Japan Co., Cincinnati, Ohio.
Kennedy, Spaulding & Co., Syracuse, N. Y.
Weaver & Goss, Rochester, N. Y.
E. A. Burrows & Co., Troy, N. Y.

W. H. McMILLAN,

113 South St. (Up-stairs), Bet. Peck Slip and Beekman St.,

NEW YORK,

BLOCK AND PUMP MANUFACTURER.

Manufacturer of Inside Iron Strap and all kinds Tackle Blocks,
MAST HOOPS, HANKS, BELAYING PINS, HAND SPIKES, HAND PUMPS, &c.

Also Dealer in Lignumvite Wood, for Beam Faces and Roller Beds, &c.

TELEPHONE CALLS:

Office, "Nassau 142." Factory, "Williamsburg 377."

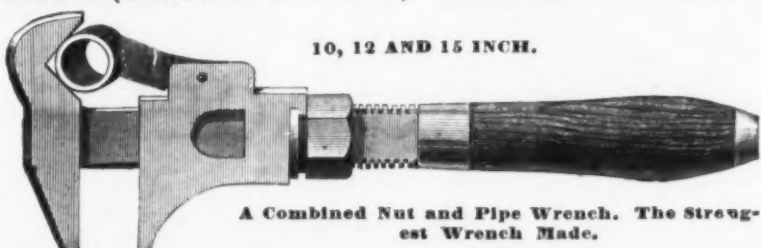
FACTORY:

32 to 40 Penn St., Brooklyn, E. D.

SOLE AGENT FOR

John Smalley's Graphite Bushings.

TOWER (Donohue's Patent) ENGINEER'S WRENCH.



A Combined Nut and Pipe Wrench. The Strongest Wrench Made.

TOWER & LYON. 96 Chambers Street, NEW YORK, U. S. A



BUCK-THORN FENCE Solid Steel. Small Barbs. No Wire
BEST IN THE WORLD.
A Flat Strip, Twisted. Plain to be seen.

Effective, Safe and Strong. Handsome, Lasting and Cheap.
Easy to build. Simple to repair. Any bright farmer's boy or smart farm hand can boss the job.
Write for Sample and Circular. The Buck-Thorn Fence Co., Trenton, N. J.

Sold by more than Three Thousand Agents throughout the United States and Canada.

EXCLUSIVE AGENCIES ONLY.

ENGINES AND MILL MACHINERY

Boilers and Piping and all kinds of Fittings.
Shafting, Pulleys, Hangers, Boxes, &c., in Stock for Prompt Delivery.
GEO. R. LOMBARD & CO., AUGUSTA, GA.,
Foundry, Machine, Boiler Works and Supply Store.
Agent in Georgia, S. Carolina, Florida and Alabama for Korting Injectors and Vandusen Jet Pumps.

TRADE PUBLICATIONS.

Copper and Brass.

We have received from Messrs. C. G. Hussey & Co., 49 Fifth Avenue, Pittsburgh, a very handsome catalogue relating to copper and brass goods, of which this firm make a specialty. Each page is a distinct and complete circular describing some feature of the business which the firm conducts, or else presenting statistics or tables useful to the trades which work these metals. There are 14 pages in all, measuring 5 x 6 inches, which are contained within neat cover pages printed in colors. The cover and the interior are joined by a single fastening placed at the upper left-hand corner. Accordingly, the collection has somewhat the appearance of a book and yet is quite unlike it. The groundwork of the cover is a whitish cream color, with a sage green bordered across the top and down the left-hand side. "Copper" is printed near the top in a bronze closely resembling the appearance of a planished sheet of that metal, while "Brass" is printed near the bottom in a bronze more nearly resembling the color that it ordinarily shows. The firm name and their location appear in fancy letters in the body of the page. The interior sheets are of a very light blue paper of good weight, and are printed in a reddish-brown ink. Across the top of several of the pages relating to copper is a bronze background closely imitating that metal, on which the names of the special articles described appear in the color of the page. Plain sheet copper, O'Neill's planished copper and copper bottoms are introduced in this manner. Other pages relating to brass are printed in a similar manner so as to represent that metal. Information is given with reference to ordinary finish, cold-rolled, smooth finish, hard and soft copper, also tinned copper, odd shapes and various goods made out of copper. A page is devoted to remarks on the use of sheet copper for roofing valleys and conductors, and attention is directed to the present low prices of this metal, which should insure its more general introduction. Brass is similarly presented. Among the tables given in this catalogue may be mentioned Weights of Sheet Copper per Square Foot and Thickness of English Wire Gauge, and Weight of Copper and Brass Wire and Plates by American Gauge. As a trade publication this collection of circulars or catalogue, whatever it may be called, is unique and will well repay an examination upon the part of any who may receive it.

The Alabama Coal Fields.

The joint committees of the Merchant's Exchange and Cotton Exchange of Mobile, Ala., have published a pamphlet 32 pages in length, entitled, "Mobile, the Great Coal Port of the Future," which contains an account of the coal fields of Alabama and the Warrior basin. The pamphlet opens with a description of the coal deposits in the Warrior basin, showing the extent of the deposits and the thickness of some of the seams, and draws attention to the facilities for transporting the coal. The next section refers to the cost of mining the coal and bringing it to the Gulf. Following this is a chapter on the qualities of the Warrior coals, and contains analyses of various Alabama and other coals, by which their relative values may be compared. The pamphlet closes with some general remarks as to the cost of Alabama coal, and the advantages possessed by Mobile for a coal depot.

Hand-Tools for Iron and Wood Working.

The new illustrated catalogue of the Millers Falls Company, of 74 Chambers Street, New York, is a pamphlet of some fifty-odd pages. The manufactures of this company embrace a very large variety of articles, more particularly hand-tools for wood iron working, besides vises, spirit levels and other accessories. The catalogue illustrates over 20 different styles of braces, drills and other boring tools, including drill braces, mounted breast drills, combination vise and drill, boring machine, double-crank breast drill, &c. They make vises of all kinds, the cuts showing some nine different varieties of bench and hand vises. Besides the articles enumerated, the Millers Falls Company manufacture jack-screws of from 10 to 80 pounds weight, various kinds of scroll-saws for both hand and foot power, tool-handles and other hardware articles of a miscellaneous character. The catalogue is very profusely illustrated, and gives tables of dimensions and prices in all cases.

Wrought-Iron Ornaments.

We have received from Messrs. C. G. Eckstein, No. 32 Liberty Street, New York, a very elaborate catalogue of wrought-iron ornaments suitable for use on sheet-metal architectural work, and also as trimmings for iron fences, verandas, grilles, railings, &c. They are done in black iron upon a forging press, and in dies that show the result of very artistic treatment. The line of goods is of the greatest interest to architects and builders generally, especially to those who are dissatisfied with the rough trimmings that are frequently applied to work wherein these goods would be useful.

Lubricating Oils.

The Binghamton Oil Refining Company, of Binghamton, N. Y., have issued two circulars directing attention to their various oils for lubricating and other purposes, among them to what is known as the "Binghamton Cyliindrol." Reports of physical and practical tests are attached, together with testimonials from those who have had the oil in use, and which certainly speak well for its properties and general efficiency.

Boilers.

The Colby Circulating Boiler Company, of Chicago, Ill., have issued a neat little catalogue setting forth the advantages of their circulating and superheating non-explosive boiler. It is profusely illustrated, and contains price lists and tables of sizes. The engravings are well executed, and clearly show the arrangements adopted by the manufacturers.

Wood Split Pulleys.

Wood split pulleys, wood bushings, pulley racks, wood-screw belt clamps, hand-screws, &c., are treated in an interesting manner in a catalogue recently sent out by the Dodge Manufacturing Company, of Mishawaka, Ind. Special attention is given to what is known as the Dodge "Independence" wood split pulley, and results are published to show its superiority over other pulleys now in the market. Engravings also are supplied enabling intending purchasers to form a good idea of its construction. In addition to the descriptions the catalogue contains the usual price lists, testimonials, &c.

The Baldwin Locomotive Works' Exhibit at New Orleans.

In a well-arranged and most attractive catalogue recently issued by the Baldwin Locomotive Works, of Philadelphia, Pa., we find a general description of the locomotives exhibited by them at the New Orleans Exhibition. The locomotives comprised in their exhibit were all constructed in the regular course of business, and, therefore, illustrate the standard construction adopted by the several roads which they represent. The catalogue embraces 42 pages, measures 7 1/4 by 10 1/2 inches, and is full of illustrations and interesting particulars.

Bolt and Nut Machinery.

An interesting little pamphlet devoted to bolt and nut machinery has just been issued by the Acme Machinery Company, of Cleveland, Ohio. Their "Acme" bolt cutters and nut tappers are described in detail, and the engravings throughout are well executed, giving a good idea of the general appearance and arrangement of the machinery under consideration. Price lists and tables of sizes, as usual, are given, together with desirable information of a more general character, the whole making a most acceptable specimen of its kind.

The Past Year's Shipbuilding on the Clyde.

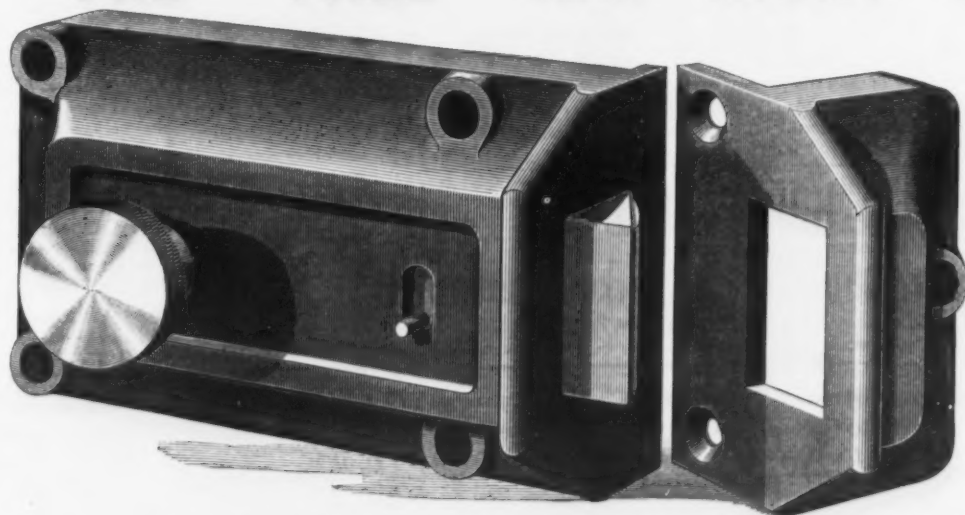
"Details are now being made up by the various shipbuilders of the shipping launched during the year on the Clyde. These are not yet complete, but I have seen sufficient of them," says a correspondent of the *Ironmonger*, "to be able to state roundly what the result will be. The aggregate tonnage of all the vessels put into the water by December 31 will be upward of 270,000 tons. If we take into account the barges that have been constructed for other countries and shipped abroad in parts, the total output will certainly not be less than 280,000 tons. This is greater than what was at the time considered the exceedingly busy year 1874, when 264,010 tons were launched, and for the sake of comparison I note that the work of the intervening years was as follows: 1875, 231,662 tons; 1876, 200,990; 1877, 176,079; 1878, 214,750; 1879, 180,576; 1880, 241,668; 1881, 340,802; 1882, 392,886, and 1883, the greatest on record, 419,749 tons. The amount of tonnage on the stocks at the end of any one year supplies a good idea, as a rule, of what the production of the succeeding year will be. At Christmas, 1882, there were 209 vessels, with an aggregate tonnage of 326,211, in the shipbuilders' hands; last Christmas there were 130, with a total tonnage of 194,280, while at present there are only about 78 vessels on the stocks and contracted for, a large proportion of which are of small tonnage compared with those that have been turned out of the yards in the past two years. Were we to receive a few Admiralty contracts in the next month or two they would help much to improve the position of the trade, but just now the prospect for the coming year is very unsatisfactory. A growing proportion of the vessels launched—indeed, all the large and notable ships—have been constructed of mild steel, which promises to supersede iron altogether for this purpose."

Work at Terre-Noire.—The Paris correspondent of the *Ironmonger* writes that at Terre-Noire the problem has been fully and adequately solved of producing enormous blocks of steel in one casting without trace of air-holes or other flaws. The same company have turned out some excellent specimens of siliicated pig—a regular mixture of iron and silicon, in which the latter ingredient represents a proportion in most cases of 20 per cent. When the steel is about to be cast, and a small quantity of the alloy referred to is added to it, the carbon of the steel is no longer oxidized; the silicon, however, is oxidized, and yields a fusible slag which floats to the top, and, as there is no oxide of carbon, there is an absence of bubbles. Pig containing 80 per cent. of manganese has been produced at the same works, which permits of an introduction into the steel of a definite proportion of the metal referred to. The steel thus obtained is of excellent quality, and has hitherto been in active request. The Creusot Works, which afford employment to 15,500 workmen, of whom 5000 are miners, will bear no unfavorable comparison with those of Krupp, of Essen. Their 13 blast furnaces produce 200,000 tons of pig iron.

"Idunium" is the name proposed by Professor Websky for the metal just discovered by him as one of the components of native vanadate of lead. The mineral is rather a scarce one, of a yellow color, and contains several other metals, of which zinc, iron and arsenic are among the most prominent. Idunium resembles vanadium in several respects, both physically and chemically, while the only oxide hitherto examined forms stable salts with alkaline bases, and thus would appear to possess distinctly acid properties.

At the last meeting of the New York Chamber of Commerce Mr. A. F. Foster presented a resolution to the effect that the Secretaries of the Navy and Treasury be solicited to adopt the proper measures to establish at New York and other important seaports of the United States stations for swinging and listing iron vessels, to determine their attraction and variations of compass, and that proper officers be detailed to supervise and carry out the work.

THE "YALE" RIM NIGHT LATCH.



ESCUTCHEON.

The Only Rim Night Latch Which Cannot be Punched Off of the Door.

ADJUSTABLE TO EITHER RIGHT OR LEFT-HAND DOORS, TO ANY THICKNESS FROM 3/4 TO 3 INCHES, TO REGULAR AND REVERSE BEVEL DOORS.

Suitable for Office, Club and Store Room Doors.

MADE ONLY BY THE

YALE & TOWNE MFG CO.,

OFFICES: STAMFORD, CONN.

NEW YORK, 62 Reade Street.
BOSTON, 224 Franklin Street.

PHILADELPHIA, 15 N. Sixth Street.
CHICAGO, 64 Lake Street.

Illustrated Catalogues of Locks, Real Bronze Hardware and Hoisting Machinery Furnished on Application.

H. D. SMITH & CO.,

Plantville, Conn.,

MANUFACTURERS OF THE

BEST QUALITY CARRIAGE MAKERS' HARDWARE,

Manufacture the Largest Variety of Forged Carriage Irons, of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

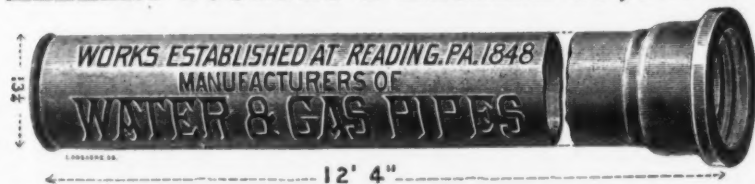
BEST CAST U.S. TOOL STEEL BROWN & CO. PITTSBURGH, PA.

TEMPLE & LOCKWOOD, 12 Platt Street, New York, Agents.

ARNOLD MELLERT, Chairman.

P. D. WANNER, Secretary and Treasurer.

MELLERT FOUNDRY & MACHINE CO., Limited.



SPECIAL CASTINGS, such as Branch Pipe, Bends, Reducers, Sleeves, Curves, &c. STOP VALVES for Water and Gas from 2 to 48 inches in diameter. FIRE HYDRANTS, RETORTS, and LAMP POSTS. FLANGE PIPE of all sizes in use. General Machinery and Castings. Car and Railroad Castings. The Improved Canada Turbine Water Wheel. Structural Work (Ornaments and Plain).

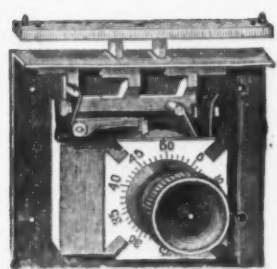
GENERAL OFFICE AT READING, PA.

A. FIELD & SONS,
MANUFACTURERS OF

WIRE NAILS

Of Every Quality and Description.

Taunton, Mass., and 78 Chambers Street, New York.



TAYLOR'S DUPLEX COMBINATION LOCKS.

The Cheapest and Best in the World. Send for Prices
RETAIL FROM \$1.50 TO \$3.00. 2500 CHANGES.

FOR ALL PURPOSES.
TAYLOR MFG. CO.,
NEW BRITAIN, CONN.

SAMUEL A. HAINES,
IRON AND HARDWARE

"SELLING AGENT,"

88 Chambers Street, New York,

AGENT FOR

HARTMAN STEEL CO.,

BEAVER FALLS, PA.,

WIRE NAILS

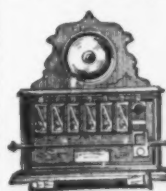
ALL KINDS. ALSO

"Open Hearth" Steel.

My friends will do themselves a favor by corresponding with me for prices before placing their orders.

I Ship all Goods from the Factory and at Factory Prices.

NOTE THE CHANGES THAT OCCUR IN THIS SPACE WEEKLY.

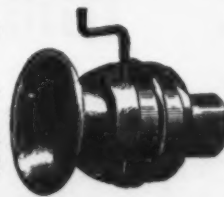


W. R. OSTRANDER & CO.,

21 & 23 ANN STREET, NEW YORK,

Manufacturers of
SPEAKING TUBES, WHISTLES, ELBOWS, ORAL ANNUNCIATORS, BELL & ELECTRIC WIRE TUBING.

Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Catalogues on application. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I.



RHODE ISLAND HORSE SHOE CO.,
MANUFACTURERS OF

Horse, Mule & Snow Shoes of the Perkins Pattern.

Works at Valley Falls, R. I.

Office, 31 Exchange Place, Providence, R. I.

W. CARPENTER, President.

C. H. PERKINS, Gen'l Manager.

R. W. COMSTOCK, Secretary

CURTIS
Pressure Regulator,
FOR
STEAM and WATER,
is made entirely of metal occupies the same space as a globe valve. It has no glands or packing, and is a lock-up valve. Write for circular. Manufactured by
Curtis Regulator Co.,
61 Beverly St., Boston, Mass.
General Agencies: 100 Liberty St., N. Y.; 19 No. 7th St., Philadelphia; 57 & 59 Market St., Chicago; 49 Holiday St., Baltimore; 24 5th St., Pittsburgh; 745 Craig St., Montreal; 707 Market St., St. Louis.

THE BARCOCK & WILCOX CO.
WATER-TUBE STEAM BOILERS.
107 Hope St., GLASGOW. 30 Cortlandt St., NEW YORK.

BOSTON: 50 Oliver St.
PHILADELPHIA: 37 N. 4th St.
PITTSBURGH: 58 2nd Ave.
CHICAGO: 64 S. Canal St.
NEW ORLEANS: 41 Carondelet St.
SAN FRANCISCO: 501 Mission St.
CINCINNATI: 64 W. 3d St.
Send to nearest office for circular.

COBB & DREW
Plymouth, Mass.,
Manufacturers of Copper, Brass and Iron Rivets; Common and Swedes Iron, Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trunk, Clout and Cigar Box Nails, &c. Rivets made to order.

NEW YORK AGENCY,
GRUNDY & DISOSWAY
HARDWARE,
165 GREENWICH STREET,
Agents for the Philadelphia Star Carriage and Tire Bolts.

John McLean,
Manufacturer of
Ayers' Hydrants.
Stop Cocks & Galvanized Cemetery Supplies.
295 & 298 Monroe St., N. Y.

COLD ROLLED
STEEL AND IRON
Figures, Letters, Stamps and Type.
SEND FOR CIRCULAR.
Bellows & Dickey,
Sheriff St., near Opera House
CLEVELAND, OHIO.

Norwich Bolt Works. William C. Lanman,
NORWICH, CONN.

Carriage Bolts, Whiffletree, and Fancy Head Bolts, Hand-Forged from Genuine Norway Iron. None in Market finer in quality or in finish. Prices as low as for Inferior Work.

STEEL FORGINGS

From 100 Pounds to 10,000 Pounds.

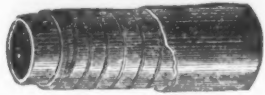
Pennsylvania Steel Company.

Address

L. S. BENT, Supt., Steelton, Dauphin Co., Pa., Or STEPHEN W. BALDWIN, Agt., 160 Broadway, N. Y.

A. WYCKOFF,

Manufacturer of

**WOOD WATER PIPE**

FOR

MINES, COKE OVENS AND
WATER WORKS.**Chain Pump Tube,
Curbs, &c.**

ELMIRA, N. Y.

R. COOK & SONS,

Manufacturers of

Carriage & Wagon AXLES,

WINSTED, CONN.

ESTABLISHED - - - - 1839.

N. Y. Mallet and HANDLE WORKSManufacturers of
Calkers', Carpenters', Stone Cutters',
Tin, Copper and Boiler Makers'**MALLETS,**Hawking Beetles, Hawking and Calking Irons;
also all kinds of Handles, Sledge, Chisel and Hammer
Handles. Also**COTTON AND RAIL HOOKS.**
Patented Feb. 13, 1877; a new combination of Hooks.
436 E. Houston St., New York City.

158
CHAMBERS ST.
NEW YORK CITY
F. R. EMMONS & BRO.
TACKS
E. PHILLIPS & SONS,
Manufacturers,
SO. HANOVER,
MASS.

THE MENEELY HARDWARE CO.,

WEST TROY, N. Y.

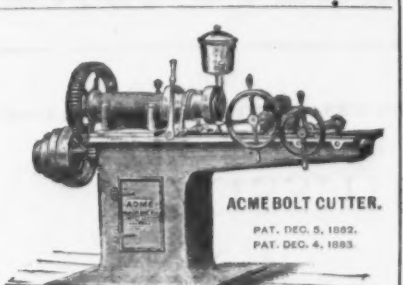
Improved German and Safety Harness Snaps,
Link Snaps, &c. Rope and Web Halters, Cattle
Ties, &c. Breast, Halter and Hitching Chains.**HORACE F. SISE, Agt., 100 Chambers St., N. Y. City.**
Send for Illustrated Circular and Price List.**MILLER BROS.**Trade Mark on Steel Pens,
Ink Erasers and Rocket
Cutlery guarantees quality.
Largest makers of Fine Crucible Steel Goods in the country.
STEEL PENS with nibs and action mailed to every hand.
Full assortment of Pens mailed on receipt of 25 cents.Acme Pen.
Sold by all dealers. Price Lists furnished on application.
The Miller Bros. Cutlery Co., Meriden, Ct.**The Bolton Steel Co.**

CANTON, OHIO,

MANUFACTURERS OF BEST REFINED

Tool Steel

And Other Fine Grades of

CAST STEELACME BOLT CUTTER.
PAT. DEC. 5, 1882.
PAT. DEC. 4, 1883.**ACME MACHINE COMPANY,**
Manufacturers of
BOLT AND NUT MACHINERY,
CLEVELAND, OHIO.**PHOSPHOR TIN.**By using my Phosphor Tin, manufacturers can
make any desired grade of Phosphor Bronze
themselves, by the simple process of melt-
ing, much cheaper than they are now to be had
in the market. New or old copper can be used.
For circulars and prices address**FRED. NAUMANN,**Sole Agent for the United States and Canada,
New York, 479 and 481 Broome Street.**KEYSTONE SCREW CO.,**

17th and Venango Sts., Philadelphia.

J. BILLERBECK,Manufacturer of
IRON AND BRASS

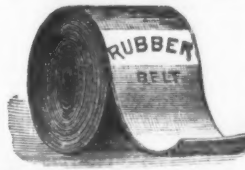
Gimlet-Pointed Wood Screws.

WRITE FOR DISCOUNTS.

Vulcanized Rubber Fabrics

ADAPTED TO

MECHANICAL PURPOSES.

RUBBER BELTING and PACKING.Machine Belting,
Steam Packing,
Leading Hose,
Suction Hose,
Grain Elevators,
Steam Hose,
Piston Rod Packing,
Gaskets and Rings,Vacuum Pump Valves,
Ball Valves,
Car Springs,
Wagon Springs,
Gas Tubing,
Machine Belting,
Billiard Cushions,
Emery Wheels.This company manufactured the immense DRIVING and ELEVATOR BELTS for the Buckingham
Elevators at Chicago, which have been running perfectly for more than Twelve Years, also those for
Armour, Dole & Co., of Chicago, Vanderbilt's Elevators for the N. Y. Central & Hudson River R. R., the
great Elevators of the Penna. and Erie Railroads, of Jersey City and Hoboken, Dow's Stores, of Brook-
lyn, and many others. In fact, the largest Belts for the largest Elevators in the world.
A single carrier belt in the Penna. R. R. Elevator is over 200 feet long, weighing 18,000 pounds, and
has run perfectly from the start.**LINEN and COTTON HOSE.**

Plain and Rubber Lined,

Circular Woven-Seamless Antiseptic RUBBER
LINED "CABLE" HOSE and "TEST"
HOSE, Vulcanized Para Rubber and Carbolized Duck,
for the use of Steam and Hand Fire Engines, Force
Pumps, Mills, Factories, Steamers, Ships, Hospitals, &c

"TEST" HOSE.

"CABLE" ANTISEPTIC.

Emery Wheels and Packing.

ORIGINAL

Solid Vulcanite**EMERY WHEELS**

Emery Wheel.

LARGE WHEELS MADE ON CAST-IRON CENTER IF DESIRED.

The properties of these Wheels are such that they can be used with great advantage and economy
for cutting, grinding and finishing wrought and cast iron. Chilled iron, Hardened Steel, Slate, Marble,
Glass, etc. These wheels are extensively used by manufacturers of Hardware, Cutlery, Edge Tools,
Flows, Saws, Stoves, Fire Arms, Wagon Springs, Axes, Skates, Agricultural Implements, and small
Machinery of almost every description.

Pat. Jan. 25, 1885.

PATENT ELASTIC**Rubber Back Square Packing,**

BEST IN THE WORLD.

Pat. Jan. 25, 1885.

For Packing the Piston Rods & Valve Stems in Steam Engines & Pumps.

B represents that part of the packing which, when in use, is in contact with the piston rod.
A the elastic back which keeps the part B against the rod with sufficient pressure to be steam tight.
This Packing is made in lengths of about 30 feet and of all sizes from 1/4 to 3 inches square.**Corrugated Rubber Mats and Matting,**

Pat. Jan. 25, 1885.

For Halls, Flooring, Stone and
Iron Stairways, &c.

Pat. Jan. 25, 1885.

This practical and indispensable article—
especially for wear where exposed
to ice, snow or slush—was first intro-
duced by this company several years
ago, and its real value is in being
almost indestructible, when
proper materials are used in
its manufacture, while the cheap,
inferior quality forced on the public by
reckless imitators of our patent goods soon becomes brittle
and crumbles to pieces. Address

Pat. Jan. 25, 1885.

RUBBER MAT.

RUBBER MATTING.

NEW YORK BELTING & PACKING CO.,
Warehouse 15 Park Row (Opposite Astor House), New York.Branches: No. 308 Chestnut Street, Philadelphia; 151 Lake Street, Chicago;
52 and 54 Summer Street, Boston.**JOHN H. CHEEVER, Treas. JOHN D. CHEEVER, Dep. Treas.**

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

Pat. Jan. 25, 1885.

**The New York Chamber of Commerce
on Tariff Matters.**

The monthly meeting of the Chamber of
Commerce, on the 8th inst., was unusually
interesting. The Chamber adopted an elab-
orate report on the question of undervalua-
tions of merchandise which was made by a
committee. The report discredits the pre-
valing belief that a great deal of money is
annually lost by the Government by reason
of willful undervaluations of merchandise at
this port, although admitting that every year
thousands of entries are successfully dis-
puted and advanced by the Custom House.
The reason given for the occurrence of so
many cases of apparent undervaluations is,
that "importers commonly submit to these
exactions because the law allows them no
recourse to the courts, a second apprais-
ment being final and without appeal." It is
further asserted that protected domestic
interests and Treasury agents concentrate
their influence and vigilance in New York,
resulting in the assessment here of much
higher values, and even higher rates of duty,
than are exacted at Boston, Philadelphia,
Baltimore, Chicago, St. Louis, or any other
custom house in the country; in other words,
merchants who escape the discernment and
skill of New York appraisers by entering
their goods at other ports, or by forwarding
their importations in bond from this city to
some interior, and, perhaps, small and ob-
scure custom house for appraisal, on what is
known as an inland transportation entry,
succeed in paying on lower valuations and
inferior rates of duty than they would incur
if their goods passed through the ordeal of
the appraisers' stores in this city.

As these difficulties arise under the appli-
cation of ad valorem rates of duty, the
committee denounce such rates as follows:
"Your committee finally report their unani-
mous opinion that the just ascertainment of
market value is practically impossible; that
the valuation elements of our tariff, beside
being unjust to the purchaser of goods, are
a constant source of undignified dispute be-
tween the Government and the importer,
lending impunity to schemes both to defraud
the revenue and to harass and oppress the
merchant, and, therefore, your committee
maintain that duties should be made wholly
specific where practicable, and where not
practicable the goods should either be placed
on the free list, or, if they remain subject
to valuation, they should, in all cases where
the Custom House is dissatisfied with the
importer's valuation, be taken by the Gov-
ernment to its own account at the importer's
declared value, plus a reasonable percentage
for expenses and profit. Your committee
believe, however, that there is no article of
merchandise for which a proper and conven-
ient specific duty cannot be fixed if petty
private and personal interests are waived."

Other action taken on tariff matters is not
of as great interest to our readers as the
foregoing. Mr. F. B. Thurber submitted a
report of his efforts to secure from men in
various businesses their views upon the
Spanish-American treaty. His report against
the treaty was circulated, and in two days
more than 500 signatures, representing a
wide diversity of trades and manufacturing
interests, were obtained. The opinion was
practically unanimous that no concessions
which Spain could make are a just equivalent
for the enormous revenues proposed to be
relinquished by the United States, and that
the public interest was being sacrificed for
the benefit and at the instigation of private
interests specially interested.

New Iron Ore Fields in Canada.

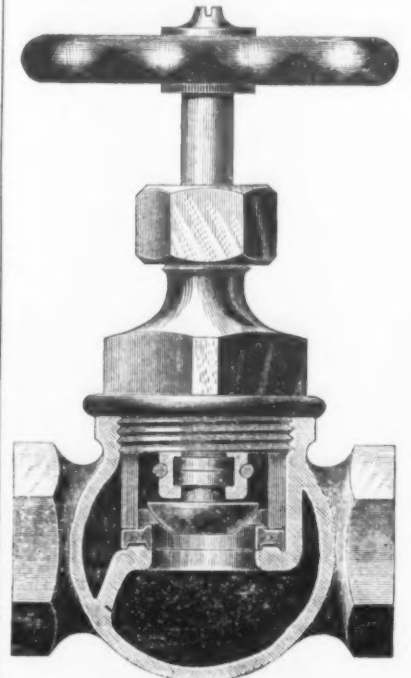
From Mr. S. J. Ritchie, president of the
Central Ontario Railway Company, says the
Cleveland Iron Trade Review, we learn that
several important discoveries of iron-ore
deposits have, within the past six weeks,
been made on the property of the syndicate
of which he is a member, and very near the
line of his railroad. If present appearances
are a safe guide, these developments will, he
assures us, prove the richest that have yet
been made in Canada. The first and most
important find is in the Township of Tudor,
County of Hastings, Ontario, about 14 miles
south of the Coe Hill Mine. The discovery
was purely accidental and came about by the
uprooting of several large trees, which, fall-
ing, stripped the surface of the earth for
some distance around, exposing what is
apparently a very large body of ore. From
measurements thus far made it is believed
that this vein is fully 60 feet wide and of
very considerable length. Analyses of speci-
mens taken out show no titanium and no
sulphur. This deposit and one other lie
within sight of the railroad track. In Lake
Township, a short distance west of the rail-
road, two additional deposits have very
recently been discovered, one of them of an
ascertained length of 3000 feet. A branch
railroad is now being run to the new mines.
From analyses made it is stated that the ores
yielded 65 per cent. of metallic iron, .02 per
cent. of phosphorus, and neither titanium
nor sulphur. Work at the Coe Hill Mine has
been going steadily forward, the main shaft
having reached a depth of about 100 feet and
the ore continually improving in quality. The
new hoisting plant has been put in opera-
tion and is working satisfactorily. The ap-
parently narrow vein which was noted as
running parallel to the large deposit has,
we are informed, been found to be of much
larger size than was at first supposed, in-
dicating an aggregate width of the combined
veins—should they be found to come to-
gether below the intervening granite—of
fully 100 feet.

As illustrating the excessively low rates at
which ocean freights are being carried, we
quote the following story from an English
contemporary: "A new and cheap way of
conveying goods from Liverpool to London
has been inaugurated by an enterprising firm
of Transatlantic steamship owners. A Liver-
pool firm having 1000 tons of rough freight
for London, finding that 10/ was the lowest
rate quoted, made overtures to the man-
agers of a Transatlantic line, who accepted the
goods at 6/ provided they were not tied as
to delivery. The shippers, being in no hurry,
accepted these terms, and the route specified
in the bills of lading was via New York. The

goods would go out to New York as dead
weight, and would there be transferred into
a London-bound steamer."

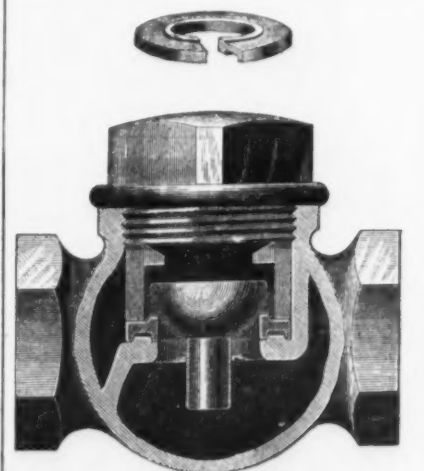
The Blessing Valves.

The Albany Steam Trap Company, of
Albany, N. Y., manufacturers of the Albany
return steam traps, placed on the market
a short time ago Blessing's patent removable
seat and disk, globe, stop and check-valves,
which, as will be seen by the engravings,
have some novel features. They are so con-
structed that the seat and disk can be re-
newed without disturbing the main shell
of the valve from its position in the pipes.
As will be seen, the seat is a simple ring,
with a groove in the lower side for an elas-

Sectional View of the Blessing Removable
Seat, Stop and Check Valves.

tic packing ring, and has a slightly raised
surface to correspond with the spherical sur-
face of the disks. This ring or seat does not
have to be screwed into place, but is simply
dropped into position, and is held by the bot-
tom surface of the cage, which is cast on the
lower side of the cap. When the cap is
screwed down to its place the cage presses
the elastic packing ring against the raised
projection underneath it, making a perfectly
tight joint, the packing being held and con-
fined in its place by the groove in the under
side of the removable seat. To renew the
seat it is only necessary to remove the cap,
lift out the seat and drop in a new one, or,
if a little grinding will make it tight, the
parts to be ground are taken out in the
hands, and the grinding can be conveniently
done in a few minutes, without disturbance
to the other parts of the valve. The disks
for the stop-valves are held on the stem by
means of a collar, in halves, clamped together
by a spring ring in a way to be free to adjust
itself on the stem, and at the same time
being secure against working itself loose
from the stem, as is sometimes the case
where the screw nut is used.

The check-valve has the renewable seat,
as shown by small cut. It is shown detached

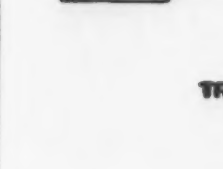


Section Showing Renewable Seat and Disk.

from its place in the valve, and broken, so
that the groove for holding the packing ring
may be seen. The check disk is spherical
in form, with a stem at the bottom to give it
weight to gravitate to its seat, the valve
being so constructed that no guide-stems are
necessary either at the top or bottom of the
disk. The disk cannot possibly "stick up"
off its seat, while the wearing surface of the
disk is materially increased over the valves
with stem guides. The renewables—the seats
and disks—are cast from the best phos-
phor-bronze, the high price being an ob-
stacle in the way of using it in the whole
body of a valve. By the construction of the
Blessing valve it enables the manufacturer
of them to use this expensive metal in the
wearing parts—the seats and disks—with
but slight additional cost of the valve, be-
cause these parts are but a fraction of the
weight of the entire valve. The different
parts are all made to standard gauges, and
will be furnished at small cost when required.
If not convenient to order the renewable
seats as described, they are simply plain
rings with a groove, and can be turned out
in an engine lathe by a machinist out of any
piece of material suitable for the purpose.
A further advantage of this is that it often
happens that metal other than stem metal or
bronze is desirable in connection with chemi-
cal solutions, &c. The end of the stem for
the hand-wheel is made square, which pre-
vents the wheel getting loose and turning on
the stem, the wheel being of a convenient
shape to be easily grasped by the hand.

PHOSPHOR-BRONZE

-FOR-

BEARINGS, SLIDE VALVES, CYLINDER RINGS, CROSS-
HEAD GIBS, STEPS, BUSHINGS,And all purposes where Maximum Durability, Anti-Frictional
and Non-Cutting Qualities are Desirable.**PUMP RODS,
BOLTS & NUTS,
MACHINE and WOOD
SCREWS, &c., &c.**Combine Toughness, Strength, Durability and
Resistance to Corrosion.

TRADE MARKS!

"Phosphor-Bronze."CASTINGS OF ALL KINDS TO ORDER.
SEND FOR PAMPHLET AND PRICES.**THE PHOSPHOR-BRONZE SMELTING CO., LIMITED,**
No. 512 Arch St., PHILADELPHIA, PA.

Owners of the U. S. Phosphor-Bronze Patents. Sole Manufacturers of Phosphor-Bronze in the U. S.

Merrill Brothers,26 First Street,
BROOKLYN, N. Y.**HAMMERS,
FORGINGS and
POWER PRESSES.**

BUFFALO PORTABLE FORGES AND HAND BLOWERS.



Warranted Superior to any other make, and
Guaranteed to give Perfect
Satisfaction.

For sale by all the leading
Iron, Hardware and Machinery
Dealers throughout the country

BUFFALO FORGE COMPANY,

BUFFALO, N. Y.

Send for Complete Catalogue.

SNELL MANUFACTURING COMP'Y.

ESTABLISHED 1790.

FISKDALE, MASS.

IMPROVED

SHIP AUGERS

AND
SHIP AUGER BITS.

Superior to any ever before made. Every
Auger and Bit Warranted.

ALSO MANUFACTURERS OF

Boring Machines. Boring Machine Augers.
Carpenters' Augers. Car Bits.

Russell Jennings' Pattern Auger Bits. Kentucky Post
Augers and Rafting Augers.

SNELL'S SUPERIOR EXTRA

Cast Steel Auger Bits.

Medals and First Premium Awards of Massachusetts, 1841,
1848, 1850. Centennial Exhibition, Philadelphia,
1876. International Exhibition, Paris, 1878.

The Snell Car Bits are used by all the large Car Manufacturers
of the United States. They are superior to all others in quality,
and enjoy the highest reputation.

Bates, Wilson & Co.,

SOLE AGENTS.

294 Broadway, - NEW YORK.

PENFIELD BLOCK COMPANY
LOCKPORT, NEW YORK.
MANUFACTURERS.
AGENCIES WITH
H.B. NEWHALL CO. NEW YORK & BOSTON.
S.H. & E.Y. MOORE CHICAGO.
WOOD AND WROUGHT IRON BLOCKS FOR RAILROAD AND MINING WORK A SPECIALTY. LARGEST AMERICAN MANUFACTURERS OF WROUGHT BLOCKS. CATALOGUES FURNISHED AND SAMPLE ORDERS SOLICITED.

THE ASBESTOS PACKING CO.,

MINERS AND MANUFACTURERS OF
ASBESTOS.

Offices: 169 Congress St., Boston.
33 John St., New York.

Steam Packings,
Wick, Fiber,
Mill Board,
Flooring Felt
Cement Felting,
Pipe and Boiler Coverings,
Cloth, Yarns, &c.
BOLLING & LOWE,
General European Agents.

2 LAWRENCE POUNTNEY HILL, LONDON, E. C.

CRESCENT
TUBE SCRAPER
CYCLONE STEAM FLUE CLEANER
FOR HORIZONTAL AND UPRIGHT BOILERS
FROM 1/2 TO 16 INCHES
CRESCENT MANUFACTURING CO.
SOLE MANUFACTURERS
CLEVELAND, OHIO, U.S.A.

John Q. Maynard, Eastern Agent, 112 Cortlandt St., New York. Selig, Sonenthal & Co., Agents, London, E.C.



DUNN'S
PATENT
SAW SET
AND
GUMMER.

Four perfect sets com-
bined in one.

For Price Lists and Discounts, address

FLAGLER, FORSYTH & PIERSON,

MANUFACTURERS' AGENTS

298 Broadway, New York.

WATER.

CITIES, TOWNS AND MANUFACTORIES

SUPPLIED BY GREEN & SHAW

Patent Tube and Gang Well System.

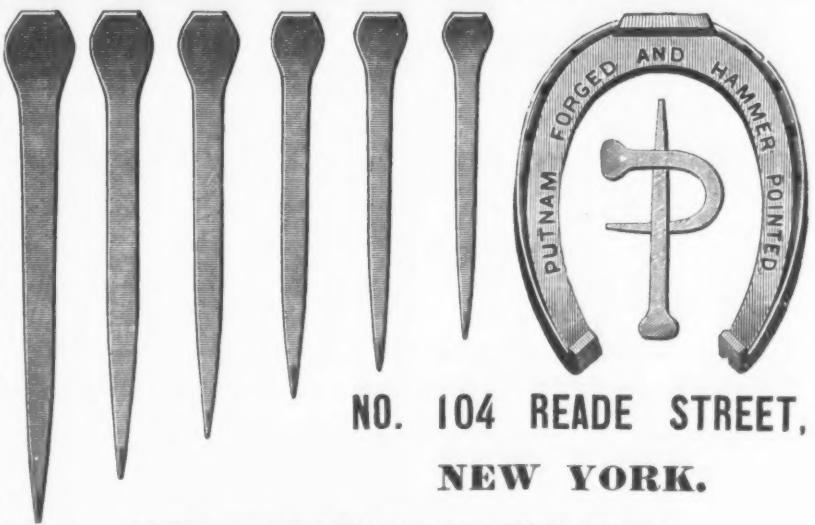
WM. D. ANDREWS & BRO.,

233 Broadway, New York.

Infringers of above patents will be prosecuted.

**PRESSES, DIES AND OTHER
SHEET-METAL TOOLS**
FERRACUTE MACHINE CO.
BRIDGEPORT, N. H.

LIVINGSTON HORSE NAIL CO.



NO. 104 READE STREET,
NEW YORK.

OWNERS OF THE FOLLOWING WELL-KNOWN BRANDS:

"EMPIRE BRONZED," "BAY STATE,"
"WESTERN," "ANCHOR" AND "CHAMPION"
HORSE NAILS.

THE PARAGON PRUNING SAW,

WITH
Convex and Concave
Cutting Edges.



Patented
April 1st, 1884.

THRUST CUT ON THE CONVEX EDGE.

DRAW CUT ON THE CONCAVE EDGE.

A Fair Trial will Demonstrate that this is the best DOUBLE-EDGED SAW for Trees or Vines.

WHEELER, MADDEN & CLEMSON, Middletown, N. Y.

VIRGINIA NAIL AND IRON WORKS COMPANY,

LYNCHBURGH, VIRGINIA.

NAILS and Bar Iron of Superior Finish, made exclusively from Pig Iron.

Crawford's Patent Adjustable
Screw Holder and Driver
COMBINED.



Price, per doz. 4-in., \$6.00; 5-in.,
\$7.50; 6-in., \$9.00.

SEND FOR CIRCULAR AND DISCOUNTS.
Chicago Screw Driver Works,
83 East Erie St., Chicago, Ill.

WHITE MOUNTAIN FREEZER CO.

Manufacturers of

SANDS' PATENT TRIPLE MOTION

White Mountain Ice Cream Freezer.

The only Freezer ever made having three distinct
motions, thereby producing finer, smoother Cream than
any other Freezer on the market. Acknowledged by
every one to be the best in the world. Over 300,000
in use to-day. Outside Irons Galvanized, but all inside the
can coated with Pure Black Tin. Tubs water-proof;
easily adjusted and operated. We also carry large stock
of Packing Tubs, Packing Cans, Ice Crushers, &c. Send for
Price List and Trade Discounts. Address

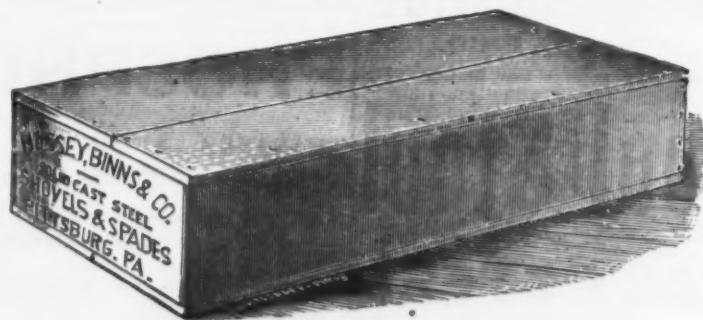


White Mountain Freezer Co.,
101 E. HOLLIS ST., NASHUA, N. H.

ESTABLISHED 1835
HARDWARE & TOOL CO.
BEMIS & CO.
SPRINGFIELD, MASS.
ALL GOODS STAMPED BEMIS & CO.
NONE OTHERS GENUINE.



BEECHER & PECK,
MANUFACTURERS OF
DROP PRESSES,
DROP FORGINGS, &c.,
NEW HAVEN, CONN.



PRICES QUOTED ON APPLICATION.

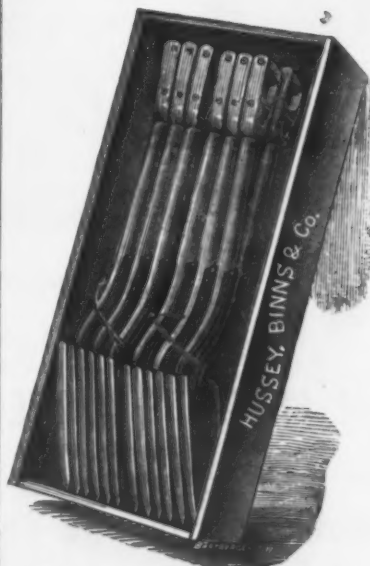
HUSSEY, BINNS & CO.

(LIMITED),

PITTSBURGH.

DURRIE & McCARTY,

NEW YORK AGENTS.



One Dozen (Box), No. 820, Opened Ready for
Sale in Store.

GALLOWAY BOILER

IMPROVED UNDER PATENTS OF 1875 AND 1876.

Safety Economy in Fuel, Low Cost of Maintenance Dry Steam without Superheating, Large Reserve Power

ARE THE ADVANTAGES OFFERED BY THIS BOILER IN A PRE-EMINENT DEGREE.

3000 Horse-Power in Progress and for Immediate Delivery. Correspondence Solicited.

EDGE MOOR IRON COMPANY

SOLE LICENSEE AND MANUFACTURER FOR THE UNITED STATES,

POST OFFICE, WILMINGTON, DELAWARE.

Philadelphia Office, 1600 HAMILTON STREET - - New York Office, 79 LIBERTY STREET.

WM. SELLERS, Pres. JNO. SELLERS, JR., Vice-Pres. ELI GARRETT, Sec. and Treas. GEO. H. SELLERS, Gen. Supt.

BELLAIRE STEEL NAILS

MANUFACTURED BY THE

BELLAIRE NAIL WORKS,

MANUFACTURERS OF

Pig Iron, Steel Nails, Blooms, Billets, &c.

OFFICE AND WORKS,

BELLAIRE, OHIO.

DURRIE & McCARTY, 97 Chambers St., New York, Sole Eastern Sales Agents.

ANTI-FRICTION, WROUGHT IRON

VICTOR BARN DOOR HANGER AND RAIL.

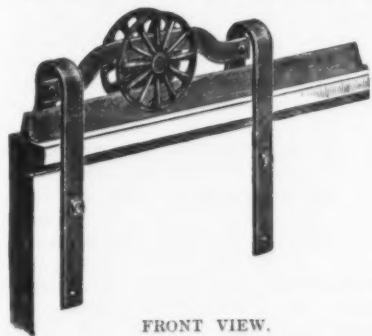
NO FLANGE WHEELS.

IT REQUIRES NO OIL.

IMPOSSIBLE TO DERAIL.

THOUSANDS ALREADY IN USE.

Where introduced it outsells all others. Try a sample lot and test them. Write for circulars and prices.



FRONT VIEW.



REAR VIEW.

FOR SALE BY

SARGENT & CO., New York City,
H. & G. E. KNIGHT, Philadelphia, Penn.,
ARTHUR EMORY, Baltimore, Md.,
BIGELOW & DOWSE, Boston, Mass.,
AUSTIN BROS., Stockton, Cal.

MANUFACTURED BY

VICTOR MANUFACT'G CO.,

NEWBURYPORT, MASS.

★ N. Y. S. S. P. Co. ★

E. T. COPELAND, General Agent, 30 Cortlandt St., New York City,

BUILDERS OF

STEAM ENGINES AND BOILERS.

The productions of the *New York Safety Steam Power Co.* have been in the market for fifteen years, and are widely used and highly esteemed wherever known.

2500 ENGINES, - - 50,000 HORSE-POWER.



Gendron Iron Wheel Co.
TOLEDO, OHIO,

Manufacturers of

IRON AND STEEL WHEELS.

All sizes and descriptions of

Iron and Steel Wheels for

Hay Rakes, Cultivators,

Wheelbarrows, &c.

Also Steel Wheels with Rubber Tires for Children's Carriages, Velocipedes, Bicycles, &c.

Write for Prices.



\$9 WILL BUY ONE

ALL RIGHT

Self-Feed, STEAM

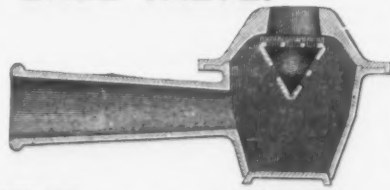
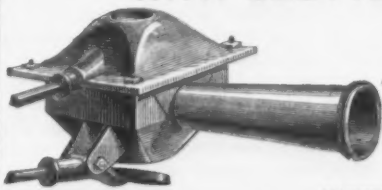
& HAY CUTTER.

The knife is steel and tempered, and is fastened to lever with three bolts, and can be easily taken off to be sharpened. The length is regulated by the lever to which the knife is bolted. The higher the lever is raised the longer it will cut. All are warranted. Send for Circular and Price List, which will be mailed free.

NEWARK MACHINE CO., Columbus, O.

The T. H. Bullock
BELLOWS The Best for the Money.
Cleveland, Ohio. FORGES

FILLEY'S "DIAMOND F" TUYERE IRON WITH SLOTTED BALL VALVE.



MANUFACTURED BY:

ST. LOUIS MALLEABLE IRON CO.,

2106 to 2128 Market Street ST. LOUIS.

C. R. HEIZMANN.

A. A. HEIZMANN.

PENN HARDWARE WORKS,
READING, PENNSYLVANIA

MANUFACTURERS OF

Frame and Axle Pulleys, Hat and Coat Hooks, Shelf Brackets, Locks, Mineral and Porcelain Door Knobs, AND A LARGE LINE OF BUILDERS' HARDWARE.

Send for Illustrated Catalogue and Price List.

The Reagan Transportation Bill.

On the 8th inst. the Reagan transportation bill passed the House of Representatives by a vote of 160 to 75; 38 Republicans and 122 Democrats voting in the affirmative, and 50 Republicans and 25 Democrats in the negative. It is stated that a great many men who voted for the bill did so under protest, and with the expectation that the Senate will substitute for it a bill substantially like the bill reported by a majority of the House Committee on Commerce, for which the Reagan bill was substituted.

Section 1 of this bill, which has just been approved by the House, provides that "it shall be unlawful for a person or persons engaged alone, or associated with others in the transportation of property by railroad or by pipe lines, or to line from one State or Territory to or through one or more other States or Territories of the United States, or to or from any foreign country, directly or indirectly, to charge or to receive from any person or persons any greater or less rate or amount of freight, compensation or reward than is by him or them charged to or received from any other person or persons for like and contemporaneous service in the carrying, receiving, delivering, storing or handling of the same. All charges for such services shall be reasonable, and any person or persons having purchased a ticket for passage from one State to another, or paid the required fare, shall receive the same treatment and be afforded equal facilities and accommodations as are furnished all other persons holding tickets of the same class without discrimination. But nothing in this act shall be construed to deny to railroads the right to provide separate accommodations for passengers as they may deem best for the public comfort or safety, or to relate to transportation relating to points wholly within the limits of one State; provided, that no discrimination is made on account of race or color, and that furnishing separate accommodations with equal facilities and equal comforts, at the same charges, shall not be considered a discrimination. Nor shall any railroad company or its officers charge to or receive from any person who is to be conveyed from one State or Territory into another any sum exceeding three cents per mile for the distance to be traveled by such person, and all persons engaged as aforesaid shall furnish without discrimination the same facilities for the carriage, receiving, delivery, storage and handling of all property of like character carried by him or them, and shall perform with equal expedition the same kind of services connected with the contemporaneous transportation thereof as aforesaid. No break, stoppage or interruption, nor any contract, agreement or understanding, shall be made to prevent the carriage of any property from being, and being treated as, one continuous carriage, in the meaning of this act, from the place of shipment to the place of destination, unless such stoppage, interruption, contract, agreement or understanding was made in good faith for some practical and necessary purpose without any intent to avoid or interrupt such continuous carriage or to evade any of the provisions of this act."

Section 2 makes "any rebate, drawback or other advantage, in any form upon shipments made or services rendered."

Section 3 declares that "it shall be unlawful for any person or persons engaged in the carriage, receiving, storage or handling of property, as mentioned in the first section of this act, to enter into any combination, contract or agreement by changes of schedule, carriage in different cars or by any other means, with intent to prevent the carriage of such property from being continuous from the place of shipment to the place of destination, whether carried on one or several railroads." The pooling of freights or the division of the earnings of such railroads is also declared unlawful.

Section 4 makes unlawful the charging of greater rates for a short distance than for a long one, which includes the shorter.

Section 5 provides that all persons, in carrying property as provided in the first section of this act, shall adopt and keep posted up schedules which shall plainly state: 1. The different kinds and classes of property to be carried. 2. The different places between which such property shall be carried. 3. The rates of freight and prices of carriage between such places, and for all services connected with the receiving, delivery, loading, unloading, storing or handling of the same; and the accounts for such service shall show what part of the charges are for transportation and what part are for loading, unloading and other terminal facilities. These schedules are to be printed in type not smaller than pica, are to be kept plainly posted in at least two places in every depot where freights are received or delivered. They are to be filed within 15 days after posting with the clerk of the Circuit Court of the United States in and for each judicial district in or through which any railroad may be operated, and are to be kept as official records.

Section 6 declares that the act applies to all property and the compensation therefor, whether it is carried wholly on railroad or pipe line or by several.

Section 7 provides that any person or persons violating any provision of the act "shall pay to the person or persons who may sustain damage thereby a sum equal to three times the amount of the damages so sustained," the damages to be recovered by suit in any State or United States Court of competent jurisdiction, where the person or persons causing such damage can be found or may have an agent, office or place of business. If the court shall be of opinion that the violation was willful, it shall make an allowance by way of additional costs to the person injured, sufficient to cover all his counsel and attorney fees. It is also provided that the corporation officials and others summoned to testify must give evidence, "and no claim that any such testimony or evidence might or might not tend to criminate the person testifying or giving evidence shall be of any avail, but such evidence or testimony shall not be used against such person on the trial of any indictment against him." No action shall be sustained unless brought within one year after the cause of action shall accrue, or

within one year after the party complaining shall have come to a knowledge of his right of action, and as many cases of action as may accrue within the year may be joined in the same suit or complaint. And any Circuit or District Court of the United States having jurisdiction of the persons shall have the power, upon application of any person or persons, firms, railroads or other corporations or associations, alleging undue and unjust discrimination against a person in violation of the provisions of this act, to issue writs of mandamus against such person, commanding such person to move and transport freight or to furnish facilities for transportation for the party applying for the writ, upon such terms and in such manner as shall seem just and proper to the court in order to prevent any undue or unjust discrimination against the relator. No cause brought under this act in any State court of competent jurisdiction shall be removed to any United States Court.

Section 8 provides that any director or officer of any corporation or company acting or engaged as aforesaid, who shall violate or willingly permit the violation of the act shall be guilty of a misdemeanor, and on conviction shall be fined not more than \$2,000.

Under Section 9 property handled wholly in one State, United States property and articles destined for charitable purposes are exempted from the provisions of the act, and may be shipped at rates lower than those charged the general public.

Analyses of Virginia Iron Ores.

From a recent number of the *Virginia* we take the following series of analyses of Virginia iron ores, grouped by the geological formations from which these ores were obtained:

1. Iron Ores from No. 1, the Potsdam.

	No. 1.	No. 2.	No. 3.	No. 4.
Iron peroxide.....	25.4	79.77	.....	.....
Iron sesquioxide.....	51.33	.....	.....	.....
Silica.....	42.69	6.75	.....	.....
Alumina.....	1.73	0.80	.....	.....
Magnesia.....	1.53	0.05	.....	.....
Lime.....	.....	0.13	.....	.....
Phosphoric acid.....	.....	trace.	.....	.....
Manganese oxide.....	.....	trace.	.....	.....
Water.....	12.85	.....	.....	.....
Metallic iron.....	41.41	37.98	55.84	55.30
Phosphorus.....	0.010	0.06	0.12	.....
Sulphur.....	.....	0.17	.....	.....

	No. 5.	No. 6.	No. 7.	No. 8.
Iron peroxide.....	71.34	.....	.....	.....
Silica.....	17.57	8.44	.....	.....
Alumina.....	13.69	.....	.....	.....
Phosphoric acid.....	1.52	1.52	.....	.....
Manganese oxide.....	1.33	0.93	.....	.....
Metallic iron.....	59.54	49.94	49.63	55.16
Phosphorus.....	1.08	0.66	1.08	0.56
Sulphur.....	.....	.....	.....	.....

	No. 9.	No. 10.	No. 11.
Iron sesquioxide.....	70.00	71.18	.....
Silica.....	4.73	10.00	.....
Alumina.....	0.96	0.88	.....
Magnesia.....	.....	.....	.....
Lime.....	.....	.....	.....
Manganese oxide.....	13.31	.....	.....
Water.....	11.02	8.02	.....
Loss, &c.....	0.18	0.12	.....
Metallic iron.....	.....	.....	60.16
Phosphorus.....	.....	.....	.....
Sulphur.....	.....	.....	.....

No. 1.—From Blue Ridge at C. & O. Ry. tunnel; analysis by O. Wuth.

No. 2.—From Blue Ridge, near Mt. Torrey furnace, Augusta County, Va.; analysis by J. W. Mallett.

No. 3.—From Fox Mountain, Shenandoah Iron Works; analysis by Booth & Garrett.

No. 4.—From Bedford Iron Works, Pulaski County, "Clark" ore bed; analysis by Booth & Garrett.

No. 5.—From Radford Iron Works, Pulaski County, from Vein 1 at furnace; analysis by Brown & Corliss.

No. 6.—From Radford Iron Works, Pulaski County, from Vein 2 at furnace; analysis by Booth & Garrett.

No. 7.—From Sawmill Run, E. of Waynesboro, Augusta County; analysis by J. B. Britton.

No. 8.—From Sawmill Run, E. of Waynesboro, Augusta County; analysis by H. DuPuy.

No. 9, 10.—From Shenandoah Iron Works, Page County, from Fox Mountain; analysis by W. M. Bowron.

No. 11.—From Shenandoah Iron Works, a mile S. W. of Fox Mountain; analysis by Booth & Garrett.

2. Iron Ores from No. 11, the Valley Limestones.

	No. 1.	No. 2.
Iron peroxide.....	57.28	35.52 Per. ox.
Iron sesquioxide.....	76.69	71.36 Mag. ox.
Silica.....	5.70	1.83
Alumina.....	.....	trace
Magnesia.....	.....	0.07
Lime.....	.....	0.05
Phosphoric acid.....	0.450	.....
Water.....	13.62	0.12
Metallic iron.....	55.00	70.38
Phosphorus.....	0.340	.....
Sulphur.....	0.160	0.05 SO ₂

No. 1.—From Fishersville, Augusta County; analysis by J. W. Mallett.

No. 2.—From Pearisburg, Giles County; analysis by F. A. Genth.

3. Iron Ores from No. 1, the Clinton.

	No. 1.	No. 2.	No. 3.
Iron sesquioxide.....	57.28	.....	.....
Silica.....	19.57	.....	.....
Alumina.....	1.90	.....	.....
Magnesia.....	0.43	.....	.....
Lime.....	0.45	.....	.....
Phosphoric acid.....	0.244	.....	.....
Manganese oxide.....	0.79	.....	.....
Water.....	9.61	.....	.....
Organic matter.....	10.38	.....	.....
Metallic iron.....	47.15	57.12	41.98
Phosphorus.....	0.98	.....	.....

No. 4.

Iron peroxide..... 77.38

Iron sesquioxide..... 47.965

Silica..... 15.56

Alumina..... 3.941

Magnesia..... 0.194

Lime..... 0.430

Phosphoric acid..... 0.319

Manganese oxide..... 0.184

Water..... 2.50

Metallic iron..... 54.196

Phosphorus..... 0.140

Sulphur..... trace.

No. 1.—From Roaring Run, Botetourt County; analysis by J. B. Britton.

No. 2.—From Clifton Forge, Alleghany County, fossil.

No. 3.—From Clifton Forge, Alleghany County, red shale.

No. 4.—From Cumberland Gap, upper bed; analysis by Kentucky Survey, 1877.

No. 5.—From Cumberland Gap, middle bed; analysis by Kentucky Survey, 1877.

No. 6.—From Low Moor, Alleghany County, block ore; analysis by C. E. Dwight.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, January 15, 1885.

DAVID WILLIAMS,
JAMES C. BAYLES,
JOHN S. KING.Publisher and Proprietor.
Editor.
Business Manager.

RATES OF SUBSCRIPTION, INCLUDING POSTAGE.

UNITED STATES, BRITISH AMERICA AND
SANDWICH ISLANDS.Weekly Edition.....\$4.50 a year.
Issued every THURSDAY morning.Semi-Monthly Edition.....\$2.30 a year.
Issued the FIRST and THIRD THURSDAYS of every month.Monthly Edition.....\$1.15 a year.
Issued the FIRST THURSDAY of every month.

TO ALL OTHER COUNTRIES.

PER ANNUM, POSTPAID.

Weekly Edition: \$5.00—£1—25 francs—20 marks
—12 florins—4 roubles (coin)—25 lire—20 pesetas.Semi-Monthly Edition: \$2.50—10/6—12½ francs—
10 marks—6 florins—3 roubles (coin)—12½ lire—10
pesetas.Monthly Edition: \$1.25—5/6—6½ francs—5 marks
—1½ florins—1½ roubles (coin)—6¼ lire—5 pesetas.

REMITTANCES

should be made by draft, payable to the order of
David Williams on any banking house in the United
States or Europe; or, when a draft cannot be obtained,
in postage stamps of any country.

NEWSDEALERS OR BOOKSELLERS

In any part of the world may obtain *The Iron Age*
through the American News Company, New York,
U. S. A.; the International News Company, New
York, U. S. A., and London, England; or the San Francisco
News Company, San Francisco, Cal., U. S. A.

RATES OF ADVERTISING.

One square (12 lines, one inch), one insertion, \$2.50
one month, \$7.50; three months, \$15.00; six months,
\$25.00; one year, \$40.00; payable in advance.

BRITISH AGENCY.

Office of THE IRONMONGER, 42 Cannon St., London.

DAVID WILLIAMS, Publisher,

83 Reade Street, New York.

PITTSBURGH.....77 Fourth Avenue,
JOS. D. WEEKS, Manager and Associate Editor.PHILADELPHIA.....220 South Fourth Street,
THOS. HOBSON, Manager.CHICAGO.....36 and 38 Clark St., cor. Lake,
J. K. HANES, Manager.CINCINNATI.....13 West Third Street,
HENRY SMITH, Manager.CHATTANOOGA.....Ninth and Carter Streets,
S. R. LOWE, Manager.

SOLE AMERICAN AGENCY FOR

THE IRONMONGER.

Published at 42 Cannon St., London.

The oldest and leading representative of the British
Iron and Hardware Trades.Subscription, Postpaid.....\$5.00
to countries outside of Great Britain, including
Monthly Foreign Supplement and one copy of the
Ironmonger's Diary.By a mutual clubbing arrangement between the
two journals, subscriptions to both will be received
by either *The Ironmonger* or *The Iron Age* on the fol-
lowing terms:

THE IRONMONGER and THE IRON AGE, Weekly.

In the United States and Canada.....\$7.50 or £1. 10s

In Great Britain and Ireland.....5.50 or 1. 2s

In other countries.....8.00 or 1. 12s

THE IRONMONGER, Weekly, and THE IRON AGE,
Monthly.

In the United States and Canada.....\$6.75 or 2s 6d

In Great Britain and Ireland.....5.25 or 1s 9d

In other countries.....6.75 or 2s 3d

The American Steel Trade.

The steel trade of the year 1884 opened with a good demand at Chicago, but with business quite dull at Pittsburgh, New York and other points. The range of prices for best brands of American tool steel at the centers of trade at that time was from 10 to 11 cents per pound, quotations having gradually fallen to those figures from 13 cents, which was the prevailing price during the brisk times of 1880. Low as prices were at the beginning of 1884, the excessive competition among manufacturers depressed them still further during the course of the year, until a lower range was established for steel than had ever been known on this side of the Atlantic. Standard makers, who in past years had been very conservative in matters of this kind, and who had held up both the price and quality of their goods, entered into a struggle for orders last year that resulted in the establishment of prices which would be ruinous if the raw materials used in the manufacture were always of the same high grade as formerly. A few steel-makers resisted the demoralizing influence of the scramble for business, and maintained both their price and quality, but they were indeed few. Throughout the whole year the demand gradually diminished, resulting in greater dullness and lower prices, until its close witnessed open quotations for tool steel of 8½ cents to 9½ cents per pound, according to location and quality. In the following table is exhibited the course of steel prices at New York in 1884, as reflected in our weekly reports, small lots or best quality commanding a fraction higher:

Grades.	Jan.	April.	July.	Oct.	Dec.
Tool steel.....	10¢	9½¢	9¢	8½¢	8¢
Cruc. mach'y.....	6½¢	6¢	5½¢	5¢	4½¢
Bess. & O. H. mach'y.....	3½¢	3¢	2½¢	2¢	1½¢

Under the same qualification we present below a table showing the range of steel prices at Pittsburgh during 1884:

Grades.	Jan.	April.	July.	Oct.	Dec.
Tool steel.....	10¢	9½¢	9¢	8½¢	8¢
Cruc. mach'y.....	6½¢	6¢	5½¢	5¢	4½¢
Bess. & O. H. mach'y.....	3½¢	3¢	2½¢	2¢	1½¢

Competition has been more active at Chicago for some time than at any other trade center, and consequently prices have been more seriously affected. The following table shows the course of prices at that point in 1884, taking the minimum quotation:

Grades.	Jan.	April.	July.	Oct.	Dec.
Tool steel.....	10¢	9½¢	9¢	8½¢	8¢
Cruc. mach'y.....	6½¢	6¢	5½¢	5¢	4½¢
Bess. & O. H. mach'y.....	3½¢	3¢	2½¢	2¢	1½¢

The prices given in these three tables show the effects of depression in business, as well as tables relating to other commodities which we have previously published. Steel is not exempt from the influences affecting general business. Other classes of steel goods demonstrate this fact very clearly. For instance, steel-boiler plates, which were quoted at 4½ cents to 5½ cents per pound at New York at the beginning of 1884, were sold at 3½ cents to 4½ cents at the close of the year, notwithstanding the transaction of considerable business in this line at times. Tank steel started out at 4 cents per pound and closed the year at 3 cents. The following table shows the range of steel-plate prices during 1884 at New York:

Grades.	Jan.	April.	July.	Oct.	Dec.
Tank.....	4¢	4¢	3½¢	3½¢	3¢
Shell.....	4½¢	4½¢	4½¢	4½¢	3½¢
Flange.....	5¢	5¢	4½¢	4½¢	4¢
Fire-box.....	5½¢	5½¢	5½¢	5½¢	4½¢

The course of steel wire-rod prices was rather more erratic, a strong demand from the wire works in the spring months having driven prices considerably above those prevailing at the beginning of the year. The demand culminated about the 1st of April, after which there was a gradual subsidence, ranging over a month or more, followed by profound quiet, which still continues. The following table shows the range of prices per gross ton during 1884 at New York for foreign steel-wire rods, duty paid:

	Jan.	April.	July.	Oct.	Dec.
Jan.....	\$45.00 @ \$46.00	July.....	\$47.00		
Feb.....	44.50 @ 46.00	Aug.....	46.00		
March.....	45.00 @ 50.00	Sept.....	46.00		
April.....	45.00 @ 50.00	Oct.....	45.00		
May.....	46.00 @ 50.00	Nov.....	44.00		
June.....	46.50 @ 47.00	Dec.....	44.00		

The price of syndicate steel for plows, &c., fluctuated considerably at Chicago during the year. Starting at 9 cents per pound, it advanced to 9½ cents about the middle of February, holding up very well until the month of July, when the disagreements among the manufacturers depressed the price to 6½ and 7 cents, but toward the middle of August a better understanding was effected and prices were advanced to 7 and 7½ cents, which continued to be quoted until about the last week in December, when another breakdown to 6½ and 7 cents took place, followed very shortly after by a further depression to 6 and 6½ cents.

The sale of slabs and blooms has grown to be an important feature of the steel trade, arising from the necessities of iron manufacturers, who find steel supplanting their product, and consequently turn to steel-makers for material which can be worked into finished forms by the machinery erected for the manipulation of iron. Sheet rollers, plate-makers, nail manufacturers and bar-mill owners have patronized the steel billet and slab-makers more extensively than ever during the past year, in many iron works the puddling furnaces having been wholly discontinued. In July, 1884, steel slabs for nail plates began to be quoted openly at Pittsburgh, selling then at \$32 per gross ton at works. This price gradually receded until about the middle of December \$28.50, delivered at Wheeling, was the price named for a lot of slabs for nail plate. In the East domestic nail slabs usually commanded \$32 and \$32.50, delivered at nail factories; special slabs were quoted at \$33.50 and \$35, at mill, and foreign basic slabs for specially soft work ruled at about \$37.50 and \$39, duty paid.

A year ago the weekly importations of Scotch pig iron at New York ran up to 1800 tons. During the early spring these figures were greatly diminished, in consequence of the dullness of trade, but the receipts rarely fell below 1000 tons, one or two weeks going down to 600 tons in consequence of the withdrawal from service of some of the regular steamships, owing to the lack of miscellaneous freight. Through the summer and well into the autumn the importations of Scotch pig iron maintained a fair degree of regularity, ranging from 1200 to 1300 tons weekly. Importers derived little or no profit from the business, owing to the active competition of American irons at about the same or a little lower price, and the inability to obtain easier terms on the other side, where prices had been reduced to apparently their ultimate limit. The month of November showed weekly receipts of 1000 to 1100 tons, but in December American pig iron took another downward plunge, and prices of Scotch could not follow. The effect was immediately seen in decreased imports. In the week ending December 11 only 800 tons were received, in the following week only 500 tons, and in the last week of the year only 400 tons, and in the first week of the present year only 200 tons. One of the regular pig-iron freighters recently brought in a cargo of coal, after having transported pig iron from Glasgow to New York every trip for many years. Between Southern

pig iron on the one hand crowding the New England market, and Eastern pig iron on the other hand controlling the local trade, Scotch pig iron seems nearer the end of its importation here than at any previous time. The only chance this branch of the iron trade has for a revival is either in a "boom," which would force domestic prices up again, or in a reduction of the tariff, which would remove parts of the obstacles now in the way of foreign competition. But at present there is very little hope of higher domestic prices or danger of lower duties.

The Situation in Iron.

From the various important iron centers of the country the beginning of the new year brings information of the resumption of works that have been idle for a longer or shorter period, and an increase in the number of employees at other works that had not entirely suspended. In many quarters this has been regarded as indicating an improved condition of affairs, and as the precursor of the brightening in trade prospects that will lead to the "good times" that others regard as far off. The fact of resumption cannot be doubted. The question is as to its true significance. There is no doubt that, on the whole, the country is in a good condition. Crops have been heavy; food is low in price; money is plentiful, the indications in the grain market are that, for the time at least, the lowest prices have been touched, and with the improved prices that are being secured the purchasing power of the great West is very largely increased. But while all these things furnish a basis upon which trade can build, it by no means follows that the business that can properly be done in such a condition of affairs will be done. To bring about a brisk trade and increased prices, there must be a restoration of confidence in the future, which seems to be lacking through the whole country at the present time. When buyers are satisfied not only that the lowest price has been reached, and that the probabilities are that prices will advance, or at least that there will be a scarcity of the goods they wish to buy, then, and not until then, will the demand for manufactured articles be such as to indicate the return of the good times for which all are so anxiously looking.

But do the resurrections at the iron works to which we have referred and purchases in anticipation of future wants indicate a revival of confidence from which manufacturers can argue a decided and permanent improvement in trade? In the first place, it is probable that many of the works which are reported as having resumed operations had simply been closed for stock-taking or for the holidays, and not permanently. We do not recall now any number of works that have been regarded as permanently idle that have resumed. In the second place, it should be noted that, to meet the demands even of dull times like the present, a very large proportion of the capacity of the country must continue in operation. This is too often forgotten in considering the condition of trade and the number of mills idle, or the proportion of the works running on reduced force is taken into consideration, and not the large proportion that are in operation. The true comparison as to the condition of trade is not between the actual capacity of the mills and what they produce, or the proportion of them that is idle, because in all times, even the best, there are idle mills and a failure to reach the full capacity of the works. The true comparison is between the output of different years. There are no figures showing the production of rolling mills in 1884 available as yet. Mr. Swank, however, has made an estimate of the production of pig iron for 1884, which is 4,295,414 tons; the ascertained production of 1883 was 5,146,972 tons. This shows a reduction of something over 16 per cent. As the stocks of iron on the 1st of January, 1885, were no greater than on the 1st of January, 1884, the whole production of 1884 probably went into consumption. This would indicate that the rolling mills of the country produced in 1884 about 16 per cent. less than in 1883. A large proportion of this reduction in product probably comes not from actual and complete stoppage of the mills, but from a reduction in output. It is well known that in times of low prices like the present the capacity of a rolling mill per man for the time that it is in operation is considerably increased. In times of higher wages and constant work almost any mill with a large number of furnaces will average several a day, idle for various causes. In times like the present, when the mill is in operation, the proportion of idle furnaces compared with the number idle in brisk times is very small. In other words, in a given week at the present time a mill with 50 furnaces will produce more iron by a considerable percentage than the same mill would produce in times of higher wages and better demand.

Now, in view of all these facts and the knowledge that comes to us regarding the resumption of different mills, those that are still idle and the number that are running on reduced time, it does not seem to us that the resurrections that have been noted since January 1 in any way indicate that there has been such an improvement as to justify a belief that what may be regarded as a normal condition of business in the rolling-mill industry will soon be reached. It does not occur to us that these resurrections by the mills that are in operation are more than enough to meet the consumptive de-

mand that always exists, as well in bad as in good times. We see no indications of those purchases in advance of immediate wants that indicate reviving business and that must be made before it will be safe to assume that the depression is over and the upward movement begun.

Wages in England and the United States.

Several publications of more than usual importance have recently attracted attention to the relative wages in England and this country. Secretary Frelinghuysen has submitted to Congress his conclusions from the reports of our consuls on these wages, which are to the effect that nearly all kinds of skilled labor earn from two to three times more per day in this country than the same kinds earn in England, and that the expenses of living are no greater here than there for the same things—or, in other words, that a dollar will purchase, on the whole, as much of the necessities of life in America as its equivalent will in England. Clothing, he states, is generally cheaper in Europe than it is here, but in other respects the American laborer gets more for his money. Owing, however, to the more elevated scale of his demands in this country, he spends more and has more. This is from the American side. On the other hand, Mr. J. S. Jeans, the able Secretary of the British Iron and Steel Institute, recently read before the members of the Statistical Society a paper on the "Comparative Efficiency and Earnings of Labor at Home and Abroad." The complete paper of Mr. Jeans is not at hand, but from the *résumés* of it that are in the English papers, he seems to have dealt quite carefully both with the questions of earnings of labor and its efficiency. In that part of his paper dealing with the earnings of different classes in different countries, 15 of the most important industries were selected from four of the leading industrial countries of the world in which the average wages per week show as follows:

	U. S.	Eng.
United States (Massachusetts).....	35	25
United Kingdom (Lancashire).....	30	5
Germany (Westphalia).....	21	8
France (Paris and Provinces together).....	18	10

Thus proving that in the United States wages were higher than in Great Britain by 84 per cent., while they ranged 205 per cent. above France and 162 per cent. above Germany.

It will be noted from the above table that Mr. Jeans selected Massachusetts as the locality in this country with which to compare wages. The chief industries in Massachusetts are the textile and boots and shoes, in which it is well known that the rates of wages in this country more nearly approach those paid in England than in any other of the great industries. The iron, glass and pottery industries, in which the wages paid in this country are very much more in excess of those paid in England than are the wages paid in the textile industries, are of but little importance in Massachusetts, and the rates of wages paid in the establishments in those industries that do exist in Massachusetts are among the lowest, if not the lowest, paid in the United States. This is especially true of the iron industries. Puddling, for example, is but little more than half what it is west of the Allegheny Mountains, and nail-cutting from two-thirds to three-fourths. From this it would appear that the difference between the results aimed at by Mr. Frelinghuysen and Mr. Jeans may not be so much after all. The latter makes his comparison between industries or sections that, so far as relates to this country, are the lowest paid, while the Secretary of State compares a much wider range both as to industries and sections.

Special Overland Contracts Abolished.

Merchants in the California trade have for six years past had a serious grievance with the overland transportation routes, from which they are, since January 1, fully released. Whereas they were formerly compelled to enter upon an agreement to transport all their goods by rail rather than via Cape Horn or the Isthmus, if they would take advantage of the lowest rates offered, merchants may now exercise full freedom in the management of their business, which is certainly a boon not to be lightly appreciated, even if ungraciously bestowed. The only offset for this so-called privilege is a slightly increased general average rate. On the other hand, a merchant may ship coarse and bulky merchandise by coastwise steamer or clipper, and at the same time, if he so elects, use the railways at will, on a freight arrangement differing in no respect from that of a rival in the trade. Obviously, under the special contract system, which discriminated against ocean carriage, there could be no such thing as fair competition between those who were or were not patrons of the railroads. The latter, therefore, in the face of many earnest remonstrances on the part of the hardware trade and others interested, at last gained an easy triumph. The clipper-ship interest, meanwhile, have struggled hard to maintain a position as ocean carriers with only meager profits. The latter will now take courage, but the railroad managers expect to retain their hold of the trade on account of the alleged greater dangers of the ocean route and the smaller stock which the merchant needs to keep where transportation is rapid. The notice received by shippers as a result of the

recent action of the Transcontinental Pool Association was as follows:

You will please take notice that your contract with this association expires December 31 inst., after which date all rates now in force will be withdrawn. Rates to apply on and after January 1, 1885, will be announced on or before that date.

The San Francisco *Bulletin*, in explanation, says this means that there will be only one specified freight tariff open to all merchants and individuals shipping goods between any of the principal points in the East and California. The Pool Commissioner also says in regard to the new tariff:

It does away with the contract system and substitutes for it an open tariff for all based on practically the same rates from New York as the old contract tariff for 1884, with the exception that that class of goods heretofore carried from New York for \$1 goes now on a \$1.25 minimum basis. Most all the business from St. Louis, Chicago, Pittsburgh, Buffalo, Cincinnati and the Missouri River is made on a proportion of the New York rate, opening up to the interior an opportunity for doing business, taking into consideration the relative distances. East-bound freight is not affected by the new arrangement.

It was also stated relative to the new tariff that, in some cases, certain classes of goods are rated the same as before by special contract. For instance, a staple like hardware, under open tariff, formerly was \$4; special contract, \$2.50, which latter amount is the present rate. In the new tariff there are eight classes of freight, as formerly, designated in descending scale 1, 2, 3, 4, A, B, C and D. The rate on staple articles generally remains unchanged. The odious discrimination now abolished was endured in silence, because resistance provoked quick retaliation, and no single merchant or possible combination would care to take up the gauntlet against powerful corporate monopolies. But an abuse so flagrant has borne its fruit in the menace of legislative enactments for the protection of individual rights. The monopolists have, therefore, begun their retreat.

Mexican Indebtedness.

Twice during the past two years have attempts been made between the Mexican Government and the London committee of bondholders to consolidate the debt which Mexico owes in Europe and get the payment of interest thereon resumed, but each time the negotiations have broken down. The last failure, which preceded but a short time the inauguration of the new President of the Republic, Porfirio Diaz, was due to the opposition of the people. The populace surrounded the legislative palace, a riot ensued, the soldiers fired on the people, but the Government and chambers finally yielded and the bill was withdrawn. This bill was particularly objectionable and unpopular, because it increased the capital of the old 3 per cent. indebtedness by \$3,000,000,000 in the shape of perquisites paid to certain parties to engineer the thing, but the scheme had been so clumsily conducted that it was a secret to nobody. Although these failures to resume the payment of interest are, of course, most injurious to Mexican credit in Europe, there has of late been spun such a network of financial intrigues, especially by French financiers to get control of the finances of Mexico, that the sensitiveness of the people at large in all that relates to the national finances is easily accounted for. President Diaz will not find it an easy matter to get the nation to consent to a new consolidation scheme, unless it can be stripped of all jobbery. The general impression seems to be at present among his countrymen that no fresh attempt at an agreement with bondholders will be undertaken during his term of administration, as he will not care to endanger his popularity.

The worst feature of the scheme was, as stated, that it formed part and parcel of an extensive plan by means of which a number of French financiers, in connection with the Franco-Egyptian Trust Company, tried to obtain control of the entire finances of Mexico, and hoped to absorb the whole banking business of the country. These schemers obtained a concession from President Gonzalez, Diaz's predecessor, for the founding of a national bank, which was consolidated with a local institution, the Mercantile Bank. This new banking concern, while making advances to the Government and getting these secured by a pledge of customs' revenues, also expected to manage the newly consolidated national debt by advancing the interest and obtaining further security in the shape of pledges of duties to be collected. But before this the duties had already been pledged to such an extent that over 60 per cent. of the remainder would have had to be given to this banking concern as security for advances had the bill passed as it was introduced. Gradually the country would have been ruled financially by this monopoly. The whole scheme was, indeed, so barefaced and transparent that since his inauguration President Porfirio Diaz has reduced the hold of the new bank on the customs' revenues from 40 per cent. to 15 per cent.

Unscrupulous financiers are the great curse of all bankrupt countries. They take advantage of the helplessness of their victims and force upon them measures which tie them hand and foot. In the case of Mexico, however, a fair warning has been given by public sentiment that the nation is determined that, whatever settlement may be made, it shall not be to enrich a few sharks at her expense, and that she will not allow herself to become the prey of usurers. An enormous amount of American capital is invested in Mexico in railroads, mines and

industrial undertakings of many kinds, and will be still more so in the future, it cannot be indifferent to us how that country is getting on financially, for if the European financial schemers had it all their own way, difficulties would soon arise about the payment of subsidies to American-built railways in that country, and nobody can tell what the end would be. Revolutions are easily fanned in Mexico, and the public sentiment might become so exasperated against foreigners that they and their interests would become seriously endangered. The fact is that, but for the re-election of President Diaz, there would probably have been a revolution, for the people were thoroughly disgusted with the financial and monetary management of the preceding administration. Trade was at a standstill, and discontent was general, the whole being aggravated by famine in various States of the Republic where the Indian corn crop had failed. Supplies are now pouring in, however, and it is hoped that the worst is over, and that, with the election of an executive who will encourage American capital and enterprise, a new era of prosperity is opening for our southern neighbor.

The redistribution of labor is an interesting phase of the industrial situation. Not very long ago we referred to the fact that in Western Pennsylvania idle ironworkers were departing from the vicinity of establishments in which their services were not required, and, indeed, might not be needed for many months, and that they were returning to work on farms. Many of them had been tempted from their rural occupations in the days of high wages for ironworkers. And now, from the Northwest, comes the complement of the Pennsylvania picture. It is reported that agricultural labor has been so unprofitable during the past year that many farmers in the vicinity of Galena, Ill., have taken themselves to mining. In consequence many new and valuable lead mines have been discovered. In Southern Wisconsin hundreds of farmers and laborers are at work prospecting for minerals, and several new and rich leads have been opened. It is very probable that the change of occupation thus made under stress of circumstances is not confined to the few localities which we have named. It may be presumed that all over the country this redistribution of labor is taking place wherever it is possible for an individual to control his own movements. Not all of the workmen thrown idle by the closing of manufacturing establishments, or even the majority of them, remain idle long. They seek and generally find other employment. In localities such as Western Pennsylvania, where more attention to agriculture might very properly be given, it is likely that this industrial depression will prove beneficial in securing a greater supply of agricultural products than was before possible with ironworkers in demand at wages far beyond possibilities in farming. So in the West. The withdrawal of many men from agricultural pursuits, and their employment in occupations making them consumers of farm products, will be beneficial to that section. The low price of wheat will diversify the industry of the section. This redistribution of labor will eventually help to restore the equilibrium of industry in this country. Many sections of the East have had too many manufacturing establishments and too few farmers, while in many parts of the West the opposite conditions have prevailed.

Protectionists have almost invariably favored specific duties, while free traders and revenue reformers have just as generally supported ad valorem duties. The reasons given by both classes of political economists for their preferences are so familiar that it is not necessary to rehearse them. In connection with this disputed matter the action of the New York Chamber of Commerce, at its recent monthly meeting, is very important. That body appointed a committee of importing merchants to investigate the question of undervaluations of merchandise, which occur almost exclusively under ad valorem rates of duty, being possible under specific rates only when goods are divided into several classes according to their value. This committee made a very exhaustive investigation of the subject assigned to them, and presented an elaborate report, which was adopted by the chamber, in which they expressed their belief that cases of willful undervaluation were not numerous, but at the same time, in order to avoid constant friction with custom-house authorities and frequent payment of penalties for undervaluations in consequence of errors in fixing "market values" at the place of sale, they recommended the imposition of specific duties wherever possible. They say that in their belief there is no article of merchandise for which a proper and specific duty cannot be fixed "if petty, private and personal interests are waived." This is a very remarkable statement. It seems to us, however, that the committee stopped short in their work. To completely and appropriately vindicate their investigation they should have prepared a tariff schedule embodying and exemplifying their views. It would have undoubtedly been a very valuable contribution to tariff literature.

A correspondent in Havana, who considers that his duty as an American citizen is paramount to any consideration of personal interest, writes us a letter calling attention

to a possible result of the impracticable Spanish treaty which has thus far escaped notice. He says that the treaty will so far curtail Spanish revenues in Cuba as to necessitate a recourse to some other expedient for raising money to meet expenses, and already there is talk of placing octroi or consumptive duties on goods after they enter the country. It is impossible at this time to say how far the Spanish authorities would feel warranted in thus evading the spirit of the treaty; but should this be done we should be compelled to regard it simply as a swindle, for we should have made large and important concessions in the hope of increasing in the Spanish West Indies the consumption of our manufactures, and if subject to octroi duties American manufactures would be no cheaper to the consumer than those of other countries, and their sale could not be increased. This is certainly a matter worth considering. If we should get all we expect it would be little enough in proportion to the immense sacrifices demanded at our hands, and the enormous disproportion between which reciprocal trade is proposed; but it would be worse than a mistake to leave open such a chance to neutralize even these small benefits, as our correspondent suggests. If we should accept the treaty as presented, our Spanish friends would naturally conclude we were prepared to submit to almost anything which might follow.

Since the first of January a vast amount of printer's ink has been consumed in publishing correspondence from business men, manufacturers and others respecting the condition of trade and the outlook for 1885. A score or so of enterprising journals in various parts of the country have adopted this expedient for attracting notice, and these dragnets, in the shape of circular letters, have brought to shore a queer collection of "views." We have no reason to criticize an editorial policy which discovers value in this class of contributions, for they may have another value than appears in their very limited interest as reading matter, but we venture the opinion that the best way to get at the facts is not to open the columns of a newspaper to a deluge of crude, undigested opinions from the class of men who are likely to feel flattered by invitations to write letters for publication. The sources of information open to such gentlemen are also open to an intelligent journalist, and he can make better use of crude material than the average man of business unaccustomed to writing. Moreover, the shrewd business man is not likely to tell others anything which is worth telling. As the rule, he considers it more expedient to echo the prevailing opinions of his trade and state obvious truths. The net result is that a dozen columns of "views" thus expressed could usually be summed up in a brief column editorial, which would be read with interest, whereas the "views" are not.

At last the copper pool has been broken. A few weeks ago we mentioned the fact that a suit had been brought in the Supreme Court by the Calumet and Hecla and other copper mining companies, and a temporary injunction obtained restraining the Quincy Company from making any sales of copper in violation of the agreement that from January 1, 1885, to March 31, 1886, the Calumet and Hecla Company were to market the entire production of the Lake Superior region and divide the amount received according to the quantity of the copper produced by each company. On the 8th inst. the court dissolved the injunction as being against public policy, and the members of the pool are now free to exercise their own volition in the matter of sales. They will hardly form another pool of the same character, or, if they do, they will not appeal to the courts in order to have the terms enforced.

A Philadelphia paper says that a gentleman of large experience in the manufacture of pig iron has just concluded an investigation, for a number of pig-iron manufacturers in the interior of Pennsylvania, of the advantage that blast furnaces located at tidewater have over those inland, and he reports that a furnace at tidewater, contiguous to New York harbor, can save \$4 in making a ton of pig iron as compared with a furnace in the interior of the State. We are cognizant of similar investigations having been made by other parties, with practically the same result. A few years ago some heavy capitalists were upon the point of proving the truth of the estimates submitted to them by well-informed members of the iron trade, and plans of furnaces were examined and building sites visited, but the rapid fall in the price of iron deterred them from the venture, which would probably have been profitable.

The following Associated Press dispatch from Philadelphia appeared in the daily papers of this city last Sunday:

The next meeting of the American Protective Tariff Club will be held at the Astor House, in New York, on January 15. The meeting will be large, and will include representatives from nearly all classes of industries in the United States. It is the purpose of those who originated the club to effect its permanent organization at the next meeting. It will be relieved from all suspicion of representing any distinctive class or industry. The club has considerable opposition to contend with from special industries which want their own interests to receive the greatest benefit from it. The purpose of the club is not to promote high protection to everything, but to see that protection is placed wherever it is needed, and removed wherever it is working an injury. The club will

do all in its power to have the duty on iron ore removed.

It will be observed that this dispatch contains some very curious statements. It is not usual for a protective tariff organization to favor the removal of duties from anything coming in direct competition with an article of native production. Protectionists almost invariably favor the relevation to the free list of such articles only as in the nature of things cannot be produced here. This club, if the above dispatch correctly represents its platform, will start out by endeavoring to put iron ore on the free list. But we understand that some of the most active promoters of the organization are miners of iron ore who have always insisted upon high duties. Have they changed front? If so, it is a most remarkable case of self-abnegation. We are prepared to hear a very decided protest from Eastern and Western ore producers against a tariff club starting out with the removal of the duty on iron ore as its corner stone.

Mr. Randall and Protection.

To the Editor of The Iron Age: Mr. Samuel J. Randall is facile princeps of that class of politicians known as "protectionist Democrats." This political subdivision has been growing in strength in certain sections of the country, and it is shrewdly surmised that the recent visit of this eminent gentleman to the South is for the purpose of still further developing and crystallizing in that section the belief regarding the tariff of which he is so prominent a representative. In a speech made in Louisville Mr. Randall took occasion to define his views as follows:

"I would confine the collection of public money to the levying of duty on imports into the United States at the border. I would do that through the agency of the tariff, the traditional mode of collecting the necessary funds. This leads to a question of great delicacy, about which there are many opinions. I have never been able to find in the Constitution of the United States any warrant, and I have never made any utterance, either in public or in private life, at variance with what I am now going to say. I do not believe there is in the Constitution of the United States any authority to levy impost duties for protection for protection's sake. In other words, I can find nothing which gives authority to the Congress of the United States to raise taxes on impost duties for protection purposes. I say also that I would so levy the duties on the imports into the United States that the difference between the foreign product and the American article, when the two are here in competition, so that the difference in foreign rate interest and that of our own country, the difference in the wages of the mechanic and laborer abroad and the laborer of the United States shall be equal only to fill that gap. You may talk to me about free trade. There cannot be any free trade between the United States and any country successfully when the business rate of interest in one is different from the business rate of interest in others, and where wages for like work is different in one from the other. The country which has the lower rate of interest and pays the lower rate of wages will exhaust the other."

It would be difficult to indicate what the thing Mr. Randall proposes is if it is not protection. It certainly is not "tariff for revenue only," for he advocates levying duties with reference to the wages of both labor and capital. He recommends precisely what Protectionists have been preaching for years, viz.: A tariff so adjusted as to protect the American laborer and the American manufacturer against the lower rates of wages and interest prevalent in other countries.

I do not purpose to discuss the point raised by Mr. Randall that he finds nothing in the Constitution giving authority to Congress to levy impost duties for protection. It seems to me a sufficient answer to this statement to say that the first act passed by Congress after the formation of the Constitution was one levying duties for the purpose of protection. This Congress knew what the framers of the Constitution meant by its provisions, and, having adopted the act referred to by a large vote, it is fair to presume that they meant that customs duties should be levied for the purpose of protection. The point is whether the object Mr. Randall would have in view in levying customs duty is or is not protection. The mere statement contained in the above extract from his speech read by any one who understands the plain, simple meaning of words, is, I think, sufficient to show that the thing Mr. Randall advocates is protection, pure and simple. But Mr. Randall himself intimates that it is not. Then what is it? If I understand Mr. Randall's proposition, it is that, in levying duties upon imports, they shall be so adjusted as to represent the difference in the rates of interest and the labor cost of the articles in the two countries. For example, suppose the subject for consideration before the Committee on Ways and Means is what shall be the duty on a ton of iron ore. We will assume that the amount invested in the mines, including the plant and the cash capital necessary to operate it, is the same in both countries, say, \$500,000, and the output is 100,000 tons a year. Money in England is worth, say, 4 per cent.; in this country 6 per cent. On the money invested here is at once a difference of \$10,000 against this country, which must be charged up against the 100,000 tons of ore. Upon investigating further we find that, to produce the 100,000 tons of ore in this country involves a cost for labor of at least \$1 a ton more than it does in England (we are, of course, speaking of mines similarly situated and operated in the two countries). Mr. Randall's proposition then would be that the duty on iron ore should be \$1.10. Now what has been had in view in levying this duty? Not taxes, but simply to protect the American laborer and the American capitalist against the cheaper labor and the cheaper capital of England.

I cannot understand Mr. Randall's object in trying to make out that the thing he proposes is not protection, unless it be that he hopes by a juggle of words to do

away with opposition, securing adherents for protection, but under a different name. The thing that Mr. Randall advocates is what American manufacturers have always called protection; it is a thing that has been advocated in the writings of the strongest protectionists of the country; it is the very thing that the protectionist orators in the last campaign constantly advocated from the stump, and if Mr. Randall's words are correctly reported, it would almost seem as if they were a plagiarism from the platform of the Republican party adopted at Chicago last summer. I confess that I am not anxious about a name. If Mr. Randall shall prefer to call the thing something besides protection, well and good. If the principle is embodied in law all that protectionists ask will be gained, by whatever name it is called. Respectfully, PROTECTIONIST.

WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., January 13, 1885. The steel-bloom cases are likely to possess some interest outside of the simple question of tariff. On the docket of the Supreme Court of the United States is entered "Attorney-General, May 29, 1884, Wm. H. Robertson, Collector of the Port of New York, plaintiff in error." The defendants in the suit are Richard F. Downing, Geo. W. Sheldon, J. G. Nelson and Wm. F. Shaw. The case is one of appeal from the Circuit Court of the United States in New York. The latter court reversed the decision of the Government in favor of 45 per cent., and classed the steel blooms in question at the rate of 30 per cent. As already stated in this correspondence, the Secretary of the Treasury, at the suggestion of the importers, is favorable to a withdrawal of this suit, and some days ago wrote to the Attorney-General asking his opinion on the subject. The latter officer has propounded several interrogations in reply, and until these are answered no action will be taken. To be consistent, the cases should be heard. This case is No. 853 on the docket, and consequently unless advanced will not be reached for several years.

ADDED TO THE ESTIMATES.

The House Committee on Appropriations are considering the recommendations submitted by the Secretary of the Treasury from the Secretary of the Navy for the erection of a gun factory, and for the purchase of steel for the manufacture of heavy ordnance, in accordance with the supplemental report of the Gun Foundry Board. These estimates are officially stated as follows:

For the erection of a gun factory, in accordance with the recommendation of the Gun Foundry Board, dated November 20, 1884, appointed in pursuance of the act approved March 3, 1883, \$1,000,000.

For the purchase of steel for the manufacture of heavy ordnance, in accordance with the recommendation of said Gun Foundry Board, a permanent annual appropriation, \$1,500,000.

THE LABOR COMMISSIONERSHIP.

An effort is being made to persuade the President to appoint a Commissioner of Labor Statistics before the expiration of his term. The ripple in the present phase of the question is due to the activity of the friends of Col. J. A. Price, of Scranton, Pa., who is now being pressed by ex-Associate Justice Strong, ex-Speaker Galusha A. Grow, Cyrus W. Field and other gentlemen of influence. The friends of Mr. Fahrenbach have taken fresh courage and are once more pushing his claims.

SILVER COINAGE TO BE CONTINUED.

The friends of the silver dollar, who compose the majority of the House Committee on Coinage, Weights and Measures, on Wednesday last week tabled the Buckner bill, which provides for a suspension of the coinage of silver dollars and authorizes the President to undertake negotiations with European Governments with a view to an international agreement respecting silver. This plainly shows that no action will be taken by this Congress to interfere with the compulsory silver coinage act.

THE NICARAGUAN TREATY.

In the executive session of the Senate on the 7th inst. the Nicaraguan treaty was reported back from the Committee on Foreign Relations, with a recommendation that it be ratified.

Obituary.

JOHN B. JERVIS.

John B. Jervis, the well known American civil engineer, died at his residence at Rome, N. Y., on the 12th inst. He was in his ninetieth year, having been born at Huntington, L. I., in 1795. His first important engineering service was rendered in the construction of the Erie Canal, and when that was completed he conducted the survey and construction of the Delaware and Hudson Canal. He was afterward chief engineer in charge of the construction of the Albany and Schenectady and Schenectady and Saratoga Railroads, and, for the latter road, in 1832 he invented the locomotive truck. Mr. Jervis's greatest work was the construction of the Croton Aqueduct, which supplies New York City with water, and of which he was the engineer in charge in 1836. The completion of this great work gave him a world-wide reputation, and he was engaged as consulting engineer on the Boston water works from 1846 to 1848. The following year he was made chief engineer of the Hudson River Railroad, a position which he held for two years. After this the Michigan Southern, Northern Indiana, and Chicago and Rock Island Railroads were constructed under his direction, and he was President of the Chicago and Rock Island in 1854. His next work was the building of the Pittsburgh, Fort Wayne and Chicago Railroad. Since 1868 he had lived in Rome, acting as the secretary and practical head of the Rome Merchant's Iron Mill.

Messrs. Chas. Himrod & Co., dealers in Pig Iron, Chicago and Detroit, have secured the sales agency of the Vulcan Furnace, at Newberry, Mich., and of the Detroit Furnace, and will hereafter handle all their product. The Vulcan Furnace has a capacity of 50 tons per day, and the Detroit Furnace

35 tons per day. These brands of Lake-Superior Charcoal Iron are among the best in the market.

Resuming Work at the North Chicago Rolling Mill.

The North Chicago Rolling Mill Company will resume operations at their Chicago works on the 15th inst. This mill closed down on the 15th of September last, and has been idle since that time. The South Chicago works will not be put into operation until the demand for rails makes it necessary. The Chicago mill has been started in preference to the other for several reasons. The process of making rails in this mill is very different from that of the larger works, and therefore requires a different class of help. The employees of the Chicago works did not have but about five months work during 1884, and were badly in need of employment. Starting the works is a matter of charity on the part of the company, as they assert positively that there will not be \$1 profit on the work turned out, and that their chief purpose is to give relief to suffering workmen. In coming to this decision it was necessary to make a reduction of from 8 to 20 per cent. on wages all round—being an average of about 15 per cent. on those paid during 1884. The reduction will be most felt by the laboring man, who will at the present rate receive but \$1.15 per day. It was a question, however, of work at these prices or no work at all, and the men accepted the terms. The company will blow in but one blast furnace at present, as they have some stock on hand, but in other respects will run full on double turn, employing from 800 to 1000 hands. Should business warrant the change the company will convert this mill into one for rolling steel shapes. They are now having rolls made to roll beams up to 10 inches, and would as rapidly as practical prepare to make a full line of shapes for buildings, bridges and viaducts, if sufficient power can be obtained from the machinery now in use. There is scarcely a doubt remaining but that the experiment will be tried, at least, some time between this and the 1st of May.

The bar and nail mill at Milwaukee belonging to the North Chicago Rolling Mill Company, started up on the 5th inst. The blast furnaces at these works remain idle. There are employed between 1000 and 1200 men in the departments now in operation.

The Hartup Engine Suit.

On the 5th inst. Chief Justice Murcer handed down the opinion of the Pennsylvania Supreme Court in the case of David Hostetter against the city of Pittsburgh. Dr. Hostetter was bondsman for Andrew Hartup, who contracted to build four pumping engines for the Pittsburgh Water Works, at a cost of about \$500,000. Under the terms of the contract the mechanical engineer of the city was to be arbitrator, to determine any matters in dispute between the contractor and the city. Various disputes arose between the parties, the city alleging that Hartup failed to complete the contract in a reasonable time and that much of the machinery was defective. Finally, the mechanical engineer, with the aid of the police, took the engines out of possession of the contractor by force. Upon hearing the matter in dispute the mechanical engineer, as arbitrator, awarded the city damages in the sum of \$315,000. Suit was brought against Dr. Hostetter, Hartup's bondsman, for the amount of this award. The case was removed to Beaver County, where a verdict was given in favor of the city, and judgment was entered upon the bond for Dr. Hostetter in the sum of \$375,000. Chief Justice Murcer says under ordinary circumstances there might be some objection to the mechanical engineer of the city acting as arbitrator, but as it was so provided in the contract, signed by both parties, his award is binding. He says, further, the case was thoroughly tried in the court below, and there is no reason for disturbing the judgment. Counsel for Dr. Hostetter has made a motion to have the case re argued. The motion will be disposed of by the court at a later day.

Heavy Verdict Against an Iron Company.

At Philadelphia, on the 9th inst., a verdict was rendered before Judge Biddle in the case of F. Marion Davis against the Philadelphia Iron and Steel Company. Davis was employed as a "heater" in the defendant's rolling mill on Delaware avenue, above Poplar street. In June, 1878, he was struck in the forehead by an iron clamp which became detached from a rapidly-revolving fly-wheel. His skull was crushed, and it was only after an operation which involved the removal of a piece of bone as large as a finger that he recovered consciousness. He was not able to work for months, and the medical testimony agreed that his capacity for work was permanently impaired. The jury were shown the spot in the forehead where the bone was removed, and upon close examination could discern the throbings of the brain beneath. They returned a verdict in favor of the plaintiff for \$20,000. This is said to be the largest verdict recorded in the courts of Philadelphia for many years in any suit for the recovery of damages for personal injuries.

Serious Blunder in the New Tariff.

A blunder in the tariff of 1853 has increased the importations of the single article of cloaks from \$903,000 in 1853 to \$5,000,000 in 1884. In New York and the vicinity it is said there are 25,000 cloak-makers out of work. Under the present tariff the duty on the cloth for a cloak is \$2.10, while the duty on the cloak itself is only \$1.80. The importers found that they could get a cloak made in Germany for 25 cents which cost them here about \$1.50 for making, and hence imported the goods ready-made. Mr. Cox, of New York, has introduced a measure of relief in the House.

The bell factory at Collinsville, Ill., was burned on the 13th inst., destroying 15,000 bells. The loss is between \$50,000 and \$60,000. It was established in 1849, and known all over the world as the J. C. Moore Factory.

THE UNITED BRASS CO.

No. 79 Fulton and No. 54 Gold Streets, New York,

MANUFACTURERS OF

Every Variety of Brass and Iron Goods for Water, Gas and Steam.

RACKING, LOCK, GLOBE, KEROSENE, BEER AND
IRON PETROLEUM COCKS.

Newest Patterns, MOST IMPROVED Kinds and BEST QUALITY.

NEW ILLUSTRATED CATALOGUE IN PRESS. SOLE AGENTS FOR THE HAYDENVILLE MFG. CO.



THE Iron Age Directory AND Index to Advertisements.

Agricultural Implements.	PAGE.
Nash & Bro., Millington, N. J.	43
Rock Island Plow Co., Rock Island, Ill.	39
Air Compressors.	
Clayton Steam Pump Works, Brooklyn, N. Y.	46
Norwalk Iron Works, S. Norwalk, Conn.	40
Air Brakes.	
Westinghouse Air Brake Co., Pittsburgh, Pa.	4
Alarm Money Drawers.	
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.	35
Anti-Friction Metals.	
De Plaine E. A. C., Chicago, Ill.	48
Reeves Paul S., Philadelphia, Pa.	48
Anvils, Manufacturers of.	
Flaher & Norris, Trenton, N. J.	9
Arms and Ammunition.	
Borg Hermann & Co., 101 and 103 Duane, N. Y.	103
Scott W. P., agent, 81 Chambers, N. Y.	30
Shoverling, Daily & Gales, 84 and 86 Chambers, N. Y.	30
Stevens J. & Co., Chicago Falls, Mass.	30
Asbestos.	
The Asbestos Packing Co., Boston, Mass.	14
Chalmers-Spence Co., 419 8th, N. Y.	9
Asbestos Paints.	
H. W. Johns Mfg. Co., 87 Maiden Lane, N. Y.	15
Augers and Bits.	
Jennings C. E. & Co., 96 Chambers, N. Y.	29
Bates, Wilson & Co., 294 Broadway, N. Y.	14
Axes, Springs, &c., Manufacturers of.	
Cook R. & Sons, Winsted, Conn.	13
Gaudier Steel Spring Co., Canton, N. J.	11
Johnston, Pa.	3840
Liggett Spring & Axle Co., Pittsburgh, Pa.	8
Wurster F. W., Brooklyn, N. Y.	48
Axes.	
Mann W. J. & Co., Lewistown, Pa.	2
Peck A. G. & Co., Cohoes, N. Y.	48
Bankers.	
P. W. Gallaudet & Co., 2 Wall, N. Y.	9
Bar Iron.	
Virginia Nail and Iron Works Co., Lynchburg, Va.	14
Barb Wire & Fence.	
Hals J. & Co., DeKalb, Ill.	38
Hawley & Sons, Buffalo, N. Y.	30
Iowa Barb Wire Co., 98 Reade, N. Y.	2
The Burt Thorne Fence Co., Canton, N. J.	11
Thorn Wire Hedge Co., Chicago, Ill.	2
Washington & Moon Mfg. Co., Worcester, Mass.	2
Bellows, Manufacturers of.	
Bullock T. H., Cleveland, O.	15
Scott Geo. M., Chicago, Ill.	30
Bells (Sleigh).	
Bevin Bros. Mfg. Co., Easthampton, N. Y.	10
Belting, Makers of.	
Alexander Bros., 412 N. 3d, Philadelphia, Pa.	30
Main Belting Co., Philadelphia, Pa.	30
N. Y. Belting & Co., 131 Chambers, N. Y.	13
Row, N. Y.	13
Belt Oil.	
Post E. L. & Co., 10 Peck Slip, N. Y.	33
Bicycles.	
Pope Mfg. Co., 597 Washington, Boston, Mass.	48
Bird Cages, Makers of.	
Holms & Munichauer, Buffalo, N. Y.	37
Jewett John C. & Sons, Buffalo, N. Y.	37
Pierce Geo. N. & Co., Buffalo, N. Y.	11
Lindeman O. & Co., 254 Pearl, N. Y.	3
Maxwell John, 247 and 249 Pearl, N. Y.	3
Bit Braces.	
Amidon & White, Buffalo, N. Y.	37
Ives W. A. & Co., New Haven, Conn.	34
Saxton E. R., Buffalo, N. Y.	38
Bit Holders.	
Graham J. H. & Co., 113 Chambers, N. Y.	5
Blind Awaiting Fixtures.	
North F. O. & Co., Boston, Mass.	47
Blocks, Tackle, Makers of.	
Bagnall & Loud, Boston, Mass.	47
Detroit Block Works, Detroit, Mich.	47
McCoy & Sanders, 20 Warren, N. Y.	42
McMillan Wm. H., 113 South, N. Y.	11
Penfield Block Co., Lockport, N. Y.	14
Blowers.	
Day Bros., Philadelphia, Pa.	20
Blowers, Forge and Pressure.	
Huyett & Smith Mfg. Co., Detroit, Mich.	44
Boiler Cleaners.	
Cochran & Co., Savannah, Ga.	45
Boiler Compound.	
Crecent Mfg. Co., Cleveland, O.	14
Boilers, Steam.	
Babcock & Wilcox Co., 30 Cortlandt, N. Y.	12
Edge Moor Iron Works, 79 Liberty, N. Y.	15
Harrison Boiler Works, Philadelphia, Pa.	47
Lawson Non-Explosive Boiler Co., 166 Broadway, N. Y.	15
Wetherill Robt. & Co., Chester, Pa.	47
Boiler Plates.	
Wm. McMillan & Sons, Reading, Pa.	45
The Seidel & Hestings Co., Wilmington, Del.	45
Bolt and Rivet Clippers.	
Chambers, Brother & Co., Philadelphia, Pa.	4
Bolt Cutters.	
Acme Machinery Co., Cleveland, O.	13
Howard Iron Works, Buffalo, N. Y.	45
Sellers Wm. & Co., Philadelphia, Pa.	47
Liberty, N. Y.	47
Wiley & Russell Mfg. Co., Greenfield, Mass.	37
Books.	
Comstock Wm. T., 6 Astor Place, N. Y.	9
Boring Implements.	
Amidon & White, Buffalo, N. Y.	37
Ives W. A. & Co., New Haven, Conn.	34
Reid A. H., Philadelphia, Pa.	32
Boxes for Hardware.	
Green S. H., 12 Murray, N. Y.	20
Brackets.	
Penn. Hdw. Works, Reading, Pa.	15
Brass, Manufacturers of.	
Ansonia Brass & Copper Co., 19 Cliff, N. Y.	2
Bridgeport Brass Co., 19 Murray, N. Y.	2
Brown & Bros., 31 Chambers, N. Y.	2
David John & Sons, Buffalo, N. Y.	2
Holmes, Booth & Haydens, 35 Park Place, N. Y.	2
Flame & A. Wm. Co., 22 Cortlandt, N. Y.	2
Rome Iron Works, Rome, N. Y.	2
Scoville Mfg. Co., 421 Broome, N. Y.	2
Waterbury Brass Co., 290 B'way, N. Y.	2
Brass Butt Hinges.	
Tiebout W. J., 10 & 12 Chambers, N. Y.	20
Brass Founders.	
McFarland Wm. & Son, Trenton, N. J.	4
Reeves Paul S., Philadelphia, Pa.	48
Brass Goods.	
Waterbury Mfg. Co., Waterbury, Conn.	2
Bridge Builders.	
Woolsey & Co., Bridge and Roof Co., 6 Day, N. Y.	2
Union Bridge Co., 50 Wall, N. Y.	20
Brushes.	
Brownwell Brush & Wire Goods Co., Cincinnati, O.	2
Buckets, Pump and Elevator.	
Iron Clad Mfg. Co., 22 Cliff, N. Y.	48
Builders' Hardware.	
Nimick & Brittan Mfg. Co., Pittsburgh, Pa.	4
Butcher and Shoe Knives, Manufacturers of.	
Wilson John, Sheffield, England.	10
Butts and Hinges.	
New England Butt Co., Providence, R. I.	142
Sabin Machine Co., Buffalo, N. Y.	10
Smith & Edge Mfg. Co., Bridgeport, Conn.	45
Stanley Works, New Britain, Conn.	4
Union Mfg. Co., 96 Chambers, N. Y.	3
Calipers and Dividers.	
Stevens J. & Co., Chicago Falls, Mass.	30
Car Axles.	
Roberts A. & P. Co., 365 S. 4th, Phila., Pa.	5
Carriage Bolts, Makers of.	
Townsend, Wm. & Hubbard, Phila., Pa.	45
Carriage Hardware, Makers of.	
E. D. Clapp Mfg. Co., Auburn, N. Y.	6
Smith H. D. & Co., Plantville, Conn.	12
Woodruff, Miller & Co., Mount Carmel, Pa.	39
Upon Nut Co., 96 Chambers, N. Y.	45
Car Wheels.	
Union Foundry & Pullman Car Wheel Works, Chicago, Ill.	35
Whitney A. & Sons, Philadelphia, Pa.	6
Casters.	
Phoenix Caster Co., Indianapolis, Ind.	35
Castings, Iron.	
Cheney & Sons, Manlius, N. Y.	30
Devlin Thos. & Co., Philadelphia, Pa.	7
Haight & Clark, Albany, N. Y.	34
Hammer & Co., Buffalo, N. Y.	34
North Brothers, Philadelphia, Pa.	5
Syracuse Mail Iron Works, Syracuse, N. Y.	4
Tatum Saml. C. & Co., Cincinnati, O.	7
Wetherill Robt. & Co., Chester, Pa.	47

Castings, Steel.	
Chester Steel Castings Co., 407 Liberty, Philadelphia, Pa.	48
Eureka Steel Co., Chester, Pa.	48
Flag Stanley G. & Co., Philadelphia, Pa.	48
Iron Age Co., Spuyten Duyvil, N. Y.	48
Mackintosh, Hemphill & Co., Pittsburgh, Pa.	48
Pittsburgh Steel Casting Co., Pittsburgh, Pa.	48
Standard Steel Casting Co., Thurlow, Pa.	48
Chemicals.	
Bradley & Co., 816 Richmond St., Phila., Pa.	45
Wm. H. Haskell Co., Pawtucket, R. I.	45
Cheese Scales.	
National Wire & Iron Co., Detroit, Mich.	3
Chemists.	
Haines R., Philadelphia, Pa.	5
Chemicals.	
Kimer & Amend, 205 Third av., N. Y.	41
Cherry Stoppers.	
Enterprise Mfg. Co., Philadelphia, Pa.	42
Chisels, Manufacturers of.	
Black Bros., Millbury, Mass.	13
Chucks.	
Ives W. A. & Co., New Haven, Conn.	34
Smith & Edge Mfg. Co., Bridgeport, Conn.	45
Clock Springs, &c.	
Dunbar Bros., Bristol, Conn.	7
Clothes Dryers.	
Hill Dryer Co., Worcester, Mass.	10
Coal.	
Borden & Lovell, 70 West, N. Y.	4
Winchell Coal & Mfg. Co., 111 Broadway, N. Y.	40
Coal Vases.	
Heinz & Munchauer, Buffalo, N. Y.	39
Jewett John C. & Sons, Buffalo, N. Y.	37
Winchell Coal & Mfg. Co., Cincinnati, Ind.	39
Coffee and Spice Mills.	
Enterprise Mfg. Co., Philadelphia, Pa.	42
Lane Bros., Poughkeepsie, N. Y.	39
Coke.	
Schoonmaker J. M., Pittsburgh, Pa.	35
Colters.	
Geo. K. Oyer Mfg. Co., St. Louis, Mo.	42
Compasses & Calipers, Manufacturers of.	
Bradley & Co., Syracuse, N. Y.	48
Springfield, Mass.	14338
Stevens J. & Co., Chicago Falls, Mass.	30
Copper.	
Brown & Bros., 41 Chambers, N. Y.	2
New Haven Copper Co., 230 Pearl, N. Y.	2
Pope, Cole & Co., Baltimore, Md.	2
Copying Presses.	
Stevens J. & Co., Newark, N. J.	47
Tatum Saml. C. & Co., Cincinnati, O.	7
Cordage.	
Elizabethport Steam Cordage Co., 48 South, N. Y.	30
Cornel Iron Works.	
Quincy Floor Plate and Staple Mfg. Co., Quincy, Ill.	30
Corrugated Boiler Furnaces.	
Lane Bros., Poughkeepsie, N. Y.	39
Corrugated Iron.	
Cincinnati Corrugated Co., Cincinnati, Ind.	42
Kinsley & Miller, Chicago, Ill.	37
McKenzie Iron Works, 5 Day, N. Y.	14
Cotton Presses.	
Mecklenburg Iron Works, Charlotte, N. C.	35
Coverings, Boiler and Pipe.	
Chalmers-Spence Co., 419 8th, N. Y.	9
Shields & Brown, Chicago, Ill.	30
Crucibles.	
Seld R. B., Philadelphia, Pa.	43
Cupola.	
Enterprise Furnace Co., Detroit, Mich.	43
Smith & Sayre Mfg. Co., 245 B'way, N. Y.	47
Curry Combs.	
Lawrence Curry Comb Co., 309 E. 23d, N. Y.	6
Cutlery, Importers of.	
Clatworthy F. & W., 82 Chambers, N. Y.	10
Curley J. & Bro., 134 & 136 Nassau, N. Y.	10
Cutlery, Manufacturers of.	
Jewett John C. & Sons, Buffalo, N. Y.	37
Pierce Geo. N. & Co., Buffalo, N. Y.	11
Lindeman O. & Co., 254 Pearl, N. Y.	3
Maxwell John, 247 and 249 Pearl, N. Y.	3
Dog Collars.	
Lane Bros., Poughkeepsie, N. Y.	39
Pope & Stevens, 114 Chambers, N. Y.	35
Door Checks and Springs.	
Union Door Check Spring Co., Boston, Mass.	38
Door Fasteners.	
Bay State Novelty Co., Worcester, Mass.	9
Door Hangers, House and Barn.	
Lane Bros., Poughkeepsie, N. Y.	39
Moore S. H. & E. Y., Chicago, Ill.	29
Scranton Mfg. Co., Chicago, Ill.	33
Stearns E. C. & Co., Syracuse, N. Y.	15
Victor Mfg. Co., Newburyport, Mass.	15
Drawing Instruments.	
Comstock Wm. T., 6 Astor Place, N. Y.	9
Draw Knives.	
Wilkinson A. J. & Co., Boston, Mass.	45
Drilling Machines, Makers of.	
Perkins Punch & Shear Co., 38 W. Day, N. Y.	47
Wiley & Russell Mfg. Co., Greenfield, Mass.	37
Drills.	
Elliott Sterling, Newton, Mass.	46
Drop Forgings.	
Brown R. H. & Co., Westville, Conn.	45
Lombard Geo. E. & Co., Augusta, Ga.	13
William Rose & Bros., West Phila., Pa.	7
Williams J. H. & Co., Brooklyn, N. Y.	45
Edge Tools, Makers of.	
White L. & J. L., Buffalo, N. Y.	38
Elevators, Makers of.	
Clem & Morse, Philadelphia, Pa.	46
Stokes & Parrish, Philadelphia, Pa.	46
Emery.	
Union Stone Co., Boston, Mass.	33
Emery Wheels.	
Union Stone Co., Boston, Mass.	33
Engines, Gas.	
Clerk Gas Engine Co., Philadelphia, Pa.	47
National Motor Co., 31 Chambers, N. Y.	41
Engines, Steam, Makers of.	
Cooper & Co., 22 Cortlandt, N. Y.	9
The Cummer Engine Co., Cleveland, O.	40
Lombard Geo. E. & Co., Augusta, Ga.	13
Mecklenburg Iron Works, Charlotte, N. C.	35
N. Y. Safety Steam Power Co., 30 Cortlandt, N. Y.	9
The New York Iron Works Co., S. Norwalk, Conn.	47
The Pusey & Jones Co., Wilmington, Del.	47
Wetherill Robt. & Co., Chester, Pa.	47
Engravers, Wood.	
Crosscut & West Engraving Co., Phila., Pa.	45
Expanding Mandrels.	
Cooke & Co., 22 Cortlandt, N. Y.	9
Facings, Foundry.	
Enterprise Mfg. Co., Philadelphia, Pa.	42
Lombard Geo. E. & Co., Augusta, Ga.	13
Lea & Talmor, 38 E. 10th, Boston, Mass.	41
Nicholson File Co., Providence, R. I.	8
Paul Chas. B., Williamsburg, N. Y.	8
Union File Co., Baltimore, Md.	8
Fire Brick, Makers of.	
Borgner & O'Brien, Philadelphia, Pa.	42
Gardner James, Pittsburgh, Pa.	42
Smith & Edge Mfg. Co., Bridgeport, Conn.	45
Stanley Works, New Britain, Conn.	4
Union Mfg. Co., 96 Chambers, N. Y.	3
Fire Engines.	
McLeod H. S., Troy, N. Y.	42
Newton & Co., Albany, N. Y.	42
Union Mining Co., Philadelphia, Pa.	42
Valentine M. D. & Bro., Woodbridge, N. J.	42
Watson Fire Brick Co., Perth Amboy, N. J.	42
Woodbridge Clay Mining & Refining Co., Reading, Pa.	42
Foreign Commission Merchants.	
Hosford George, 383 Broadway, N. Y.	36
Forges, Portable, &c.	
Bradley & Co., Syracuse, N. Y.	48
Buffalo Forge Co., Buffalo, N. Y.	44
Hammer & Co., Buffalo, N. Y.	34
Day Bros., Philadelphia, Pa.	20
Empire Portable Forge Co., Cohoes, N. Y.	44
Fairbank & Co., 311 Broadway, N. Y.	44
Helt Mfg. Co., Cleveland, O.	45

Forging, Iron and Steel.	
Pennsylvania Steel Co., Dauphin Co., Pa.	12
Foundry Supplies.	
Enterprise Mfg. Co., Philadelphia, Pa.	42
Friction Clutches.	
Bates H. N., Boston, Mass.	45
Furnace Hoists.	
Stokes & Parrish, Philadelphia, Pa.	46
Furnace Lamps.	
Taylor & Boggis Fdry. Co., Cleveland, O.	34
Gates, Folding.	
Composite Iron Wks. Co., 93 Church, N. Y.	3
Glass Cutters.	
Andrew Thos. J., Philadelphia, Pa.	10
Gin Ribs, &c.	
Chas. F. Lombard, Augusta, Ga.	6
Grain and Seed Separators.	
Newark Machine Co., Columbus, O.	15
Grass Bars.	
Creswell David S., Philadelphia, Pa.	47
Grinders and Polishers' Supplies.	
Union Stone Co., Boston, Mass.	33
Grindstones.	
McDermott & Berea Stone Co., Cleveland, Ohio	37
Ohio Grindstone Co., Cleveland, Ohio	37
Wood, Walter R., 283 and 285 Front, N. Y.	37
Worthington & Sons, Cleveland, O.	37
Gunpowder, Makers of.	
Lafin and Rand Powder Co., 20 Murray, N. Y.	8
Hammers.	
Buttall Hammer Co., Buffalo, N. Y.	37
Hardford Hammer Co., Hartford, Conn.	39
H. H. August, Me.	39
Hammers, Steam.	
Bradley & Co., Syracuse, N. Y.	48
Hand Force Pumps.	
Union Mfg. Co., 96 Chambers, N. Y.	7
Hardware Commission Merchants.	
Field Alfred & Co., 93 Chambers, N. Y.	10
Graham J. H. & Co., 113 Chambers, N. Y.	5
Haines, Samuel, 48 Chambers, N. Y.	13
Hardware Importers.	
Field Alfred & Co., 93 Chambers, N. Y.	10
Hardware Manufacturers.	
Enterprise Mfg. Co., Philadelphia, Pa.	42
Stanley Works, New Britain, Conn.	34
Union Mfg. Co., 96 Chambers, N. Y.	7
Hardware Specialties.	
Amidon & White, Buffalo, N. Y.	37
Andrew Thos. J., Philadelphia, Pa.	10
Liberty, N. Y.	30
Moore S. H. & E. Y., Chicago, Ill.	29
Rex A. C. & Co., Philadelphia, Pa.	20
Taylor Mfg. Co., New Britain, Conn.	32
The Charles Parker Co., Meriden, Conn.	32
Tale & Towne Mfg. Co., Stamford, Conn.	31
Machinists.	
Ad John & Son, New Haven, Conn.	45
Barnes W. F. & John, Rockford, Ill.	14
Garvin E. & Co., 130 Centre, N. Y.	47
Harrington & Co., Philadelphia, Pa.	47
McKenzie Iron Works, 5 Day, N. Y.	14
Mecklenburg Iron Works, Charlotte, N. C.	35
Peelless Punch & Shear Co., 38 W. Day, N. Y.	47
Pittsburgh Mfg. Co., Pittsburgh, Pa.	45
Sellers Wm. & Co., Philadelphia, Pa.	47
Stokes & Parrish, Philadelphia, Pa.	46
Stow Flexible Shaft Co., 14, Phila., Pa.	47
The Lancashire Co., Lancaster, Pa.	40
The Stiles & Parker Press Co., Middletown, Conn.	48
Union Foundry & Pullman Car Wheel Works, Chicago, Ill.	35
Wheeler, Robert & Co., Chester, Pa.	47
Machinists' Tools and Supplies.	
Blaird F. & Co., Worcester, Mass.	45
Bretzel John, N. Y.	47
King J. M. & Co., Waterford, N. Y.	47
Sellers Wm. & Co., Philadelphia, Pa.	47
Liberty, N. Y.	47
Mallets.	
N. Y. Handle & Mallet Works, 450 E. Houston, N. Y.	14
Penfield Block Co., Lockport, N. Y.	14
Measuring Faucets.	
Lane Bros., Poughkeepsie, N. Y.	39
Measuring Tapes.	
Korty Geo. M. & Co., 352 Classon av., Brooklyn, N. Y.	6
Metals.	
Dickerson, Van Dusen & Co., 29 and 31 Cliff, N. Y.	

Special Notices.

Railway and Machine Shop Equipment.

New and Second-hand Machinery OF ALL KINDS.

Large Stock of Cold Rolled Shafting on Hand.

SEND FOR LISTS, TOO LONG FOR PUBLICATION.

The George Place Machinery Co.,

121 CHAMBERS AND 103 READE STS.,
New York.

Second-Hand MACHINERY.

1 Pit Lathe—will take in a pulley 104 in. diameter x 24 in. 1800.
1 1/2 in. x 6 in. Shaping Machine, with Circular Attachment.
1 1/2 in. x 8 in. Shaper.
1 1/2 in. x 6 in. Drill Press.
1 1/2 in. x 6 in. Planer.
1 1/2 in. x 6 in. Bed Hand Lathe.
1 1/2 in. x 6 in. Hand Lever Machine.
1 1/2 in. x 6 in. Rotary Sizing Machine.
1 1/2 in. x 6 in. Bar Iron Cutter, 10 x 1 in. square iron.
1 1/2 in. x 6 in. Foot-Power Grindstone and Frame.
The above are all 2nd hand, and will be sold at a sacrifice.
Have also a lot of new machinery for sale cheap.

J. M. BADGER, Agent,
49 Dey St., New York City.

For Sale.

Stewart's Patent SPARK ARRESTER, the only reliable Spark Arrester made; it will prevent all sparks from escaping the STACK without checking the AIR-ENTER. Correspondence solicited from railroad companies, engine manufacturers, &c. State rights for sale. Model is sent if desired.
GEORGE STEWART,
Winston, N. C.

Traveling Salesman Wanted

For the Middle States. Must be thoroughly posted in general Hardware and House Furnishing. None others will answer. Address, giving age, experience, references and full particulars, to
"JOBBERS,"
Office of The Iron Age, 83 Reade St., New York.

Wanted.

A Salesman, young man, who has some acquaintance with Iron and Heavy Hardware Trade of the city and vicinity. Must be familiar with prices and market.
Address, with references, and state salary expected, to
"H.,"
Office of The Iron Age, 83 Reade St., New York.

Salesman Wanted,

Calling on the prominent Hardware dealers and Iron and Steel concerns, particularly in New York and New England, also elsewhere, who will handle on commission with his own line a first-class staple specialty for a manufacturer.
Address
"CARRIAGE HARDWARE,"
Office of The Iron Age, 83 Reade St., New York.

Mill Agency Wanted.

A gentleman representing a leading Sheet-Iron Mill making only best refined iron would like agency for New York and the East of first-class Mill making common Sheet, Plate or Bar Iron. Have large acquaintance and can make valuable connections.
Address
"SHEET IRON,"
Office of The Iron Age, 83 Reade St., New York.

WANTED.

City Salesman (German preferred) for Hardware and Stationery specialty for an old-established house. Only an active and energetic man can fill the bill. Address, stating former or present employment, references and experience, to
P. O. Box 1150, New York, N. Y.

AN Analytical Chemist (6) who has had a large and varied experience in analytical and technical work, desires position with Iron master or other; was last employed with large manufacturer in Scotland. Excellent testimonials, references, &c.
Address
"R. H.,"
Office of The Iron Age, 83 Reade St., New York.

WANTED—Situation as Superintendent, Foreman, or position of trust by a man of 25 years' practical experience in the manufacture of all kinds of Steel in all its branches. Address
BOX No. 118, Canastota, Pa.

WANTED.—By a gentleman of experience, a position as Correspondent and Confidential Man in an Iron merchants or manufacturers' establishment; first-class references.
Address
"FIDELITY,"
Office of The Iron Age, 220 S. 4th St., Philadelphia.

SALESMAN WANTED.—A man with not less than five years' experience in the retail Hardware business. Address by mail, stating salary; application accompanied with satisfactory references only will receive attention.
PENNYER & CRANDELL,
Little Falls, N. Y.

MACHINIST with experience in Mechanical Drawing, Pattern Making and Management of Shop and Men, and some knowledge of Mechanical Engineering, wants a situation. Manufacture of special machinery preferred.
Address
"TUBAL CAIN,"
Office of The Iron Age, 83 Reade St., New York.

Wanted.

A Salesman for Builders' Hardware.
Address
P. O. BOX 1094,
New York.

AN experienced Charcoal Blast Furnace Manager, who has made the modern way of working a specialty with East-tn. Western and foreign ores, desires an engagement. Understands furnace construction in all its details. No objection to engage in other business. Highest references. Address
"P. H. HOSKINS,"
Office of The Iron Age, 83 Reade St., New York.

WANTED.

A Machinery Salesman.
Address
"POST OFFICE BOX 2094,"
New York.

WANTED.—A position by an experienced and reliable accountant; can furnish best of references.
Address
"A. B.,"
P. O. Box 2733, N. Y.

Special Notices.

ROOT'S ILLUSTRATED HARDWARE PRICE BOOKS,

which were successfully introduced the past year, have been improved for 1885, by using extra heavy interleaving paper, with red ink down rulings, and by adding \$4 extra unbound printed and illustrated pages pertaining to miscellaneous lines on which stocks vary, of which each house can insert such as interest them. The 239 pages, bound in the regular book, show mainly the lines on which all leading American hardware stocks agree, carefully selected in the interest of the merchant, from 211 different manufacturers, with 1074 illustrations, many of them full size. Books sent at once, charges prepaid, on receipt of the following

PRICES:

Each number has the same 239 printed and illustrated pages, large type, one stock. They differ only in single or double interleaving and binding.
No. 1 contains 478 pages, every other leaf extra heavy writing paper, with red ink down rulings and down rulings, which gives one fine ruled page for noting prices, in pencil, facing every printed page. Four short stubs are placed after each 16 pages, for pasting in other leaves of new goods. Strongly and nicely bound, with dark-colored genuine morocco leather flexible cover and 1074 illustrations, many of them full size. Books sent at once, charges prepaid, on receipt of the following
No. 2, like No. 1, but red Russia leather. Price, \$7 per copy.
No. 3, like No. 1, but doubly interleaved, contains 717 pages, 478 of which are the extra heavy interleaving paper, with red ink down rulings and down rulings, which gives two interleaved pages for noting prices instead of one. The sale of No. 3 now about equals all the other numbers. Price, \$8 per copy.
No. 4, like No. 1, but without flap or pocket. Price, \$6 per copy.
No. 5, like No. 3, but without flap or pocket. Price, \$7 per copy.
No. 6, like No. 4, but red imitation Russia leather. Price, \$6 per copy.
Old No. 2, with lighter interleaving and without down rulings. A few copies are in stock, which will be closed out, including the \$4 extra pages, at Price \$5 per copy.
Special Prices given to houses ordering six or more copies at one time.
In ordering, state if you prefer Tin, Wooden and Hollow Ware left out. Not so stated, complete books will be sent, including these. These Price Books are indispensable to hardware buyers, travelers and clerks, saving often \$100 to \$200 in time, and giving better satisfaction than those made in the ordinary way. Address orders to
T. W. ROOT, Detroit, Mich.

FOR SALE.

An established Hollow-Ware manufacturing business, with a complete outfit of Flasks, Patterns, Machinery and Tools of the most modern description. A large stock of Pig Iron on hand can be had if desired. Works run by water-power, rent low, and immediate possession given. This is an excellent opportunity to buy a staple and profitable business. Address
R. C. PETERS, Auburn, N. Y.

For Sale.

A bright, clean stock of Hardware, Stoves and Tinware, in one of the best towns in Southern Michigan; population about six thousand; stock will invoice about \$5000, and in fine condition. Good chance for an energetic Hardware man.
Address
"MICH. OPPORTUNITY,"
Office of The Iron Age, 83 Reade St., New York.

FOR SALE.—The Flammor & Smith Foundry Facing and Supply Co., consisting of my stock in trade, machinery and good-will with lease of grounds and building. The Machinery consists of a run of six Mills (tower runners) Boiling, Chasing, Planing, Elevators, &c., and all kinds of all in splendid running order and up-daily by me. I will also give the recipes for the following mixtures of facings: National Return, Excelsior Return, Favorite Return, three kind of stove-plate and other mixtures of facings. These return facings are acknowledged to be superior to any other manufacture. Any further information, inquire of
E. S. HERANCOURT, Cincinnati, Ohio.

To the Hardware Trade.

Notice is hereby given that the undersigned have ceased to manufacture the following articles described in their illustrated catalogue for 1884, viz: Shelf Brackets, Nos. 0166 and 0167 of all sizes; Bird Cage Hooks, Nos. 055; Twine Box, No. 053; etc., etc., and all other articles. The undersigned have the manufacture and sale of which are protected by Letters Patent, issued to or owned by Sargent & Co.
The undersigned also hereby give further notice that they have ceased using the words "Berlin" and "Tuscan" or either of them, as descriptive of the style of finish on Hardware or upon labels, catalogues, circulars or invoices or for any other purpose whatever, having become satisfied that by such or any use of the words aforesaid they have infringed upon the Trade-Mark rights of Sargent & Co.
DUGGAN-PARKER HARDWARE MFG. CO.

Wanted—Manufacturing Property.

The undersigned wish to purchase property for Foundry business, with not less than two acres of ground, in a city of at least 10,000 inhabitants. Must be well located for shipping, with side tracks. Prefer to locate in Illinois or Ohio.
Address
SOPER & ROGERS,
Bloomington, Ill.,
or 68 Lake street, Chicago.

A Salesman with established trade amongst Stove and Hardware dealers, mining states, &c., of Eastern Pennsylvania, and whose time is only partly taken up, desires representing a Tin Plate, Stove, Mining Supply or other house in connection with his present line; has traveled for Philadelphia houses and is well posted; could make his headquarters or manage an agency at any desired point.
Address
"D. E.,"
Scranton, Pa.

TO LEASE.

Dock Lots—Hastings; 450 feet between river and railroad; two chimneys flacks and building, for manufacturing.
Address
"R. W. WELLS,"
21 Park Row, New York.

Wanted.

A practical man, with capital, to take general charge of a Car Manufacturing Company in active operation. Address
D. T. PARKER,
Anniston, Alabama.

2000 or 3000 Kegs good Nails wanted for cash, f. o. b., in New York City. Name brand and price. Address
JOS. P. QUINN,
39 Broad St., N. Y.

WANTED.—An Ore Mill for pulverizing ore for flux; with or without engine attached. State size, maker and price.
BELLFONTE IRON & NAIL CO., Limited,
Bellefonte, Pa.

THE ADVERTISER, with over twenty years' experience in selling goods for manufacturers with the Iron and Hardware trades throughout the United States, would be pleased to present one or two more manufacturers of staple goods, which can be placed in large quantities with wholesale trade exclusively. References ample.
Address
"VETERAN,"
Office of The Iron Age, 83 Reade St., New York.

THE ADVERTISER, Pattern Maker and Moulder, wish to meet with positions in their respective departments; both are highly practical men and can furnish the best of references; have both been foremen in large shops; willing to work on salary or contract; parties in the foundry business will find the above all they require. Address
"HARDWARE SALESMAN,"
Office of The Iron Age, 83 Reade St., New York.

Special Notices.

A Rare Chance for Foundrymen and Machinists.

The G. A. Kelly Manufacturing Co., 3 1/2 miles west of Jefferson, Texas, on the M. & P. R.R., will be sold at a bargain, as the present owners (bankers and merchants) are inexperienced in this line of business, and have not the time to devote to operating same.

Without exception, it has the finest machinery for putting up Wagons, Plows, &c., by Steam in the South, and by an addition of patents any and all articles made of iron can be successfully made. A Furnace situated a mile from works, making Car Wheel and Foundry iron second to none.

Plows of this Company's make have a wide and established reputation, with a good trade in Arkansas, Louisiana and Texas.

There are belonging to Works 100 Acres of Land, with sufficient Houses for accommodation of employees. Situation healthy, with abundance of pure water.

Timber plentiful and available Works.
For further information, address
R. BALLAUF & CO.,
General Managers,
Jefferson, Texas.

WHAT ARE YOU LOOKING FOR?

I have on hand a very large stock of New and Second-Hand Machinery, comprising
ENGINES, Automatic and Slide Valve,
BOILERS, Vertical and Horizontal,
STEAM AND BELT PUMPS,
STEAM ENGINE GOVERNORS,
MACHINISTS' TOOLS,
HOISTING ENGINES,
WOOD-WORKING MACHINERY,
STURTEVANT BLOWERS.

Write and state your wants, and will send full particulars.
HENRY I. SNELL, M. E.,
135 N. 3d Street,
PHILADELPHIA.

For Sale.

The Abbott Iron Company offers for sale its property and plant in Baltimore, Md.—the former, an area of more than ten acres, within the city limits, with valuable wharf and water privileges; the latter consisting of, viz:
One Bar Mill, with 21-in. train.
One Bar Mill, with 22-in. train.
Three Plate Mills, two of which are equipped with Lath's patent 3-high rolls, 31 x 95 in. and 22 x 60 in., respectively, the other with 2-high, 31 x 120 in.
Two Puddling Mills, one with 16, the other with 6 double Puddling Furnaces.
Stable, Office, &c.

For further information, apply to
ABBOTT IRON CO., Baltimore, Md.
R. FRANCIS WOOD, 206 S. 5th St., Phila., Pa.

For Sale.

Factory near Indianapolis, Ind.
The buildings and 7 acres of land known as the Telephone Factory, located just outside of Indianapolis, with a switch connection on the C. & I. St. L. and C. R. R. Main building, 100 x 30, brick, three stories and elevator in center.
Adjoining building, 20 x 40, two stories of brick. Engine and Boiler building and Smoke Stack of brick. Modern built 250 H.P. Engine, of first-class make; 3 boilers and setting; main line shafting and pulleys. Everything in good condition. Suitable for light manufacturing of any kind, or for Furniture or Agricultural Implement business. Cheap coal; small taxes; best point in the West for cheap freights.
Address
WESTERN ELECTRIC CO.,
Chicago, Ill.

Manufacturing Plant for Sale, Cheap.
The property consists of 12 acres of land, with dam, dunes and buildings that are nearly new. The water-power is never-failing, and abundant. The factories consist of
One Brick Building, 92 ft. x 36 ft., with L.
One Frame Building, 37 ft. x 17 ft.,
One Frame Storehouse, 30 ft. x 24 ft.,
and on the premises are Five Frame Tenements. A double track railroad siding runs to the factory doors, and has a new Fairbanks Track Scale. The plant has been used as a foundry and machine shop, but is adapted to any manufacturing where good power, good light and plenty of room are necessary. The location is near Hartford, and affords cheap transportation to all points at as low rates as any place in New England. The property will be sold at a very low price. For particulars, address
"H.,"
No. 60 Walnut St., Hartford, Conn.

For Sale.

The sole right to manufacture in this country a patent apparatus for purifying feed-water for steam boilers. Warranted to prevent totally their incrustation, and to enhance their efficiency about 30 per cent. Address
"E. H.,"
P. O. Box 3230, New York City.

FOR SALE.

Light Hardware, House Furnishing and Crockery Business, wholesale and retail. Well established, with brilliant prospects for steady increase capital moderate. Sell on account of ill health. This is a rare chance for good business man.
Address
"G. A. R.,"
Rochester, N. Y.

For Sale, Low.

One Horizontal Corliss Engine, 20 x 48, suitable for Rolling Mill. Several Cut-Off and Slide-Valve Engines. One Upright Corliss Boiler, 20 H.P. One No. 3 J. I. Davis Boiler Pump. Several Horizontal Boilers 18 and 20 in. diam.
D. B. CRICKSHANK,
243 Dyer St., Providence, R. I.

FOR SALE.
Reliable Water-Power and substantial Dam. Shipping facilities by canal and railroad unsurpassed. For particulars, address
JAMES YOUNG,
Middletown, Pa.

For Rent

AT BRIDGEPORT CONN.,
A brick factory, 55 x 165 feet, with a high basement and two stories; with 40-horse steam power.
Address
P. O. BOX 51,
Bridgeport, Conn.

WANTED.—A Line of Hardware from first hands to sell on commission in New England, by a Salesman who is on the road for a well-known New York house.
"HARDWARE SALESMAN,"
Office of The Iron Age, 83 Reade St., New York.

Special Notices.

New & Second-Hand Machinery.

NEW.
1 Engine Lathe, 10 in. x 3 1/2 ft.
1 each, Engine Lathes, 11 in. x 4 and 5 ft.
1 each, " " 12 in. x 5 and 6 ft.
1 Engine Lathe, 14 in. x 5, 6 and 8 ft.
1 " " 15 in. x 6 ft.
1 each, Engine Lathes, 16 in. x 6, 7, 8 and 10 ft.
1 " " 18 in. x 6, 8, 10 and 12 ft.
1 " " 20 in. x 8, 10, 12, 14 and 16 ft.
1 " " 22 in. x 8, 10, 12, 14 and 16 ft.
1 " " 24 in. x 10, 12, 14 and 16 ft.
1 " " 26 in. x 10, 12, 14 and 16 ft.
1 " " 28 in. x 10, 12, 14 and 16 ft.
1 " " 30 in. x 10, 12, 14 and 16 ft.
1 " " 32 in. x 10, 12, 14 and 16 ft.
1 " " 34 in. x 10, 12, 14 and 16 ft.
1 " " 36 in. x 10, 12, 14 and 16 ft.
1 " " 38 in. x 10, 12, 14 and 16 ft.
1 " " 40 in. x 10, 12, 14 and 16 ft.
1 " " 42 in. x 10, 12, 14 and 16 ft.
1 " " 44 in. x 10, 12, 14 and 16 ft.
1 " " 46 in. x 10, 12, 14 and 16 ft.
1 " " 48 in. x 10, 12, 14 and 16 ft.
1 " " 50 in. x 10, 12, 14 and 16 ft.
1 " " 52 in. x 10, 12, 14 and 16 ft.
1 " " 54 in. x 10, 12, 14 and 16 ft.
1 " " 56 in. x 10, 12, 14 and 16 ft.
1 " " 58 in. x 10, 12, 14 and 16 ft.
1 " " 60 in. x 10, 12, 14 and 16 ft.
1 " " 62 in. x 10, 12, 14 and 16 ft.
1 " " 64 in. x 10, 12, 14 and 16 ft.
1 " " 66 in. x 10, 12, 14 and 16 ft.
1 " " 68 in. x 10, 12, 14 and 16 ft.
1 " " 70 in. x 10, 12, 14 and 16 ft.
1 " " 72 in. x 10, 12, 14 and 16 ft.
1 " " 74 in. x 10, 12, 14 and 16 ft.
1 " " 76 in. x 10, 12, 14 and 16 ft.
1 " " 78 in. x 10, 12, 14 and 16 ft.
1 " " 80 in. x 10, 12, 14 and 16 ft.
1 " " 82 in. x 10, 12, 14 and 16 ft.
1 " " 84 in. x 10, 12, 14 and 16 ft.
1 " " 86 in. x 10, 12, 14 and 16 ft.
1 " " 88 in. x 10, 12, 14 and 16 ft.
1 " " 90 in. x 10, 12, 14 and 16 ft.
1 " " 92 in. x 10, 12, 14 and 16 ft.
1 " " 94 in. x 10, 12, 14 and 16 ft.
1 " " 96 in. x 10, 12, 14 and 16 ft.
1 " " 98 in. x 10, 12, 14 and 16 ft.
1 " " 100 in. x 10, 12, 14 and 16 ft.
1 " " 102 in. x 10, 12, 14 and 16 ft.
1 " " 104 in. x 10, 12, 14 and 16 ft.
1 " " 106 in. x 10, 12, 14 and 16 ft.
1 " " 108 in. x 10, 12, 14 and 16 ft.
1 " " 110 in. x 10, 12, 14 and 16 ft.
1 " " 112 in. x 10, 12, 14 and 16 ft.
1 " " 114 in. x 10, 12, 14 and 16 ft.
1 " " 116 in. x 10, 12, 14 and 16 ft.
1 " " 118 in. x 10, 12, 14 and 16 ft.
1 " " 120 in. x 10, 12, 14 and 16 ft.
1 " " 122 in. x 10, 12, 14 and 16 ft.
1 " " 124 in. x 10, 12, 14 and 16 ft.
1 " " 126 in. x 10, 12, 14 and 16 ft.
1 " " 128 in. x 10, 12, 14 and 16 ft.
1 " " 130 in. x 10, 12, 14 and 16 ft.
1 " " 132 in. x 10, 12, 14 and 16 ft.
1 " " 134 in. x 10, 12, 14 and 16 ft.
1 " " 136 in. x 10, 12, 14 and 16 ft.
1 " " 138 in. x 10, 12, 14 and 16 ft.
1 " " 140 in. x 10, 12, 14 and 16 ft.
1 " " 142 in. x 10, 12, 14 and 16 ft.
1 " " 144 in. x 10, 12, 14 and 16 ft.
1 " " 146 in. x 10, 12, 14 and 16 ft.
1 " " 148 in. x 10, 12, 14 and 16 ft.
1 " " 150 in. x 10, 12, 14 and 16 ft.
1 " " 152 in. x 10, 12, 14 and 16 ft.
1 " " 154 in. x 10, 12, 14 and 16 ft.
1 " " 156 in. x 10, 12, 14 and 16 ft.
1 " " 158 in. x 10, 12, 14 and 16 ft.
1 " " 160 in. x 10, 12, 14 and 16 ft.
1 " " 162 in. x 10, 12, 14 and 16 ft.
1 " " 164 in. x 10, 12, 14 and 16 ft.
1 " " 166 in. x 10, 12, 14 and 16 ft.
1 " " 168 in. x 10, 12, 14 and 16 ft.
1 " " 170 in. x 10, 12, 14 and 16 ft.
1 " " 172 in. x 10, 12, 14 and 16 ft.
1 " " 174 in. x 10, 12, 14 and 16 ft.
1 " " 176 in. x 10, 12, 14 and 16 ft.
1 " " 178 in. x 10, 12, 14 and 16 ft.
1 " " 180 in. x 10, 12, 14 and 16 ft.
1 " " 182 in. x 10, 12, 14 and 16 ft.
1 " " 184 in. x 10, 12, 14 and 16 ft.
1 " " 186 in. x 10, 12, 14 and 16 ft.
1 " " 188 in. x 10, 12, 14 and 16 ft.
1 " " 190 in. x 10, 12, 14 and 16 ft.
1 " " 192 in. x 10, 12, 14 and 16 ft.
1 " " 194 in. x 10, 12, 14 and 16 ft.
1 " " 196 in. x 10, 12, 14 and 16 ft.
1 " " 198 in. x 10, 12, 14 and 16 ft.
1 " " 200 in. x 10, 12, 14 and 16 ft.
1 " " 202 in. x 10, 12, 14 and 16 ft.
1 " " 204 in. x 10, 12, 14 and 16 ft.
1 " " 206 in. x 10, 12, 14 and 16 ft.
1 " " 208 in. x 10, 12, 14 and 16 ft.
1 " " 210 in. x 10, 12, 14 and 16 ft.
1 " " 212 in. x 10, 12, 14 and 16 ft.
1 " " 214 in. x 10, 12, 14 and 16 ft.
1 " " 216 in. x 10, 12, 14 and 16 ft.
1 " " 218 in. x 10, 12, 14 and 16 ft.
1 " " 220 in. x 10, 12, 14 and 16 ft.
1 " " 222 in. x 10, 12, 14 and 16 ft.
1 " " 224 in. x 10, 12, 14 and 16 ft.
1 " " 226 in. x 10, 12, 14 and 16 ft.
1 " " 228 in. x 10, 12, 14 and 16 ft.
1 " " 230 in. x 10, 12, 14 and 16 ft.
1 " " 232 in. x 10, 12, 14 and 16 ft.
1 " " 234 in. x 10, 12, 14 and 16 ft.
1 " " 236 in. x 10, 12, 14 and 16 ft.
1 " " 238 in. x 10, 12, 14 and 16 ft.
1 " " 240 in. x 10, 12, 14 and 16 ft.
1 " " 242 in. x 10, 12, 14 and 16 ft.
1 " " 244 in. x 10, 12, 14 and 16 ft.
1 " " 246 in. x 10, 12, 14 and 16 ft.
1 " " 248 in. x 10, 12, 14 and 16 ft.
1 " " 250 in. x 10, 12, 14 and 16 ft.
1 " " 252 in. x 10, 12, 14 and 16 ft.
1 " " 254 in. x 10, 12, 14 and 16 ft.
1 " " 256 in. x 10, 12, 14 and 16 ft.
1 " " 258 in. x 10, 12, 14 and 16 ft.
1 " " 260 in. x 10, 12, 14 and 16 ft.
1 " " 262 in. x 10, 12, 14 and 16 ft.
1 " " 264 in. x 10, 12, 14 and 16 ft.
1 " " 266 in. x 10, 12, 14 and 16 ft.
1 " " 268 in. x 10, 12, 14 and 16 ft.
1 " " 270 in. x 10, 12, 14 and 16 ft.
1 " " 272 in. x 10, 12, 14 and 16 ft.
1 " " 274 in. x 10, 12, 14 and 16 ft.
1 " " 276 in. x 10, 12, 14 and 16 ft.
1 " " 278 in. x 10, 12, 14 and 16 ft.
1 " " 280 in. x 10, 12, 14 and 16 ft.
1 " " 282 in. x 10, 12, 14 and 16 ft.
1 " " 284 in. x 10, 12, 14 and 16 ft.
1 " " 286 in. x 10, 12, 14 and 16 ft.
1 " " 288 in. x 10, 12, 14 and 16 ft.
1 " " 290 in. x 10, 12, 14 and 16 ft.
1 " " 292 in. x 10, 12, 14 and 16 ft.
1 " " 294 in. x 10, 12, 14 and 16 ft.
1 " " 296 in. x 10, 12, 14 and 16 ft.
1 " " 298 in. x 10, 12, 14 and 16 ft.
1 " " 300 in. x 10, 12, 14 and 16 ft.
1 " " 302 in. x 10, 12, 14 and 16 ft.
1 " " 304 in. x 10, 12, 14 and 16 ft.
1 " " 306 in. x 10, 12, 14 and 16 ft.
1 " " 308 in. x 10, 12, 14 and 16 ft.
1 " " 310 in. x 10, 12, 14 and 16 ft.
1 " " 312 in. x 10, 12, 14 and 16 ft.
1 " " 314 in. x 10, 12, 14 and 16 ft.
1 " " 316 in. x 10, 12, 14 and 16 ft.
1 " " 318 in. x 10, 12, 14 and 16 ft.
1 " " 320 in. x 10, 12, 14 and 16 ft.
1 " " 322 in. x 10, 12, 14 and 16 ft.
1 " " 324 in. x 10, 12, 14 and 16 ft.
1 " " 326 in. x 10, 12, 14 and 16 ft.
1 " " 328 in. x 10, 12, 14 and 16 ft.
1 " " 330 in. x 10, 12, 14 and 16 ft.
1 " " 332 in. x 10, 12, 14 and 16 ft.
1 " " 334 in. x 10, 12, 14 and 16 ft.
1 " " 336 in. x 10, 12, 14 and 16 ft.
1 " " 338 in. x 10, 12, 14 and 16 ft.
1 " " 340 in. x 10, 12, 14 and 16 ft.
1 " " 342 in. x 10, 12, 14 and 16 ft.
1 " " 344 in. x 10, 12, 14 and 16 ft.
1 " " 346 in. x 10, 12, 14 and 16 ft.
1 " " 348 in. x 10, 12, 14 and

Trade Report.

Philadelphia.

Office of The Iron Age, 220 South Fourth St.,
Philadelphia, January 13, 1885.

Pig Iron.—The feeling appears to be more settled than it was a few days ago, and while some parties complain of inactivity, others report a very satisfactory demand. In the aggregate there is no doubt that a large business has been done, but it is doubtful if prices were fully maintained. Lehigh brands have been held at firm quotations, but a considerable amount of Southern Iron was taken, presumably at lower figures than would be accepted for the first named. The reductions recently made by the Lehigh companies do not appear to have ended competition with Southern Iron, but it seems impossible for them to be sent here for any length of time at the figures now prevailing. It is a serious matter for the Pennsylvania companies, however, as they may for a long time be a permanent barrier to the re-establishment of anything like remunerative prices. Apart from this phase of the question, the market gives promise of decided improvement. The demand is increasing, and, under ordinary conditions, the volume of business done within the last 30 days would have been sufficient to impart considerable strength to the market. As it is, the question for consideration is not one of higher prices, but the reverse. Consumers are taking Alabama Irons right along, and it cannot be for any other reason than that they are cheaper. It is true that only a certain class of consumers are using these Irons, but they are the class that takes lots of from 1000 to 5000 tons at a time—parties who have been looked to in ordinary times for relief, when accumulations appeared to be impending. It may possibly be supposed that too much importance is being attached to the sale of a few thousand tons of Southern Iron, but in making an impartial statement in regard to the condition of the market the investigator is confronted with this question in every direction, and until its status is clearly defined it is impossible for prices to show any permanent improvement. Some parties claim that recent sales at the low figures named were due to financial necessities; others believe that the iron can be laid down with a small margin of profit, while another class think that they are selling at a venture without having any clear idea as to the exact cost. Pennsylvania Irons are steady, but not specially active. Sales have been made in 1000 tons lots at the quotations recently established, say, \$16 at tide, for Gray Forge; \$17 for No. 2 Foundry, and \$18 for No. 1. A few special brands command about \$1 per ton advance on these figures, but in ordinary cases quotations are as above named. Alabama Iron (chiefly Gray Forge) is offered at \$15.50, ex ship Philadelphia, with some transactions, supposed to be at about that figure delivered in consumers' yards.

Foreign Iron.—There is not much demand for anything, although two or three 500-ton lots of special brands of Bessemer were taken at something over \$19.50, Philadelphia. Other brands could be had on firm offers at about \$19; 20 % Spiegel at \$26, and 10 % at \$22 @ \$22.50.

Muck Bars.—Demand very light, with sellers at \$27 @ \$27.50 at mill, and small lots taken at \$28, delivered.

Blooms.—The demand appears to be gradually dying out. Steel Ingots and Blooms being used as substitutes. Quotations are nominally about as follows: Charcoal Blooms at \$52 @ \$53; Run-out Anthracite, \$43 @ \$44; Scrap Blooms, \$35 @ \$36; Northern Ore Blooms, \$35.

Bar Iron.—Some little improvement is reported, and inquiries show that consumers are beginning to take more interest in the market. The actual demand, however, is still very inadequate to the supply, and manufacturers are anxiously looking for new business. Proposals have been made for 2000 or 3000 cars, and there is some probability that orders will be given out, although at the moment there is nothing positive about it. On the whole, however, prospects are more encouraging than they have been, and if the foreign demand for our cereals and other products is maintained, it is quite likely to develop considerable activity in departments that have done very little of late. As a matter of fact, there are many important contracts simply waiting for a start. The terms are agreed upon, the contracts are closed, but the work is held in abeyance because the parties do not care to make a beginning until they feel sure of a general improvement in business. Mr. Greeley said in regard to specie payments, that "the way to resume was to resume;" but it seems to be more in accordance with human nature to adopt Mr. Micawber's plan, and "wait for something to turn up." Prices are very irregular, small lots from store selling at 1 1/2¢ for what is claimed to be Best Refined Iron.

Plate and Tank Iron.—Business is quiet, except for small lots, for which there is a fairly active demand. Prices are steady, and, as a rule, quoted as before, say: Ordinary Plate Iron, 2¢; Tank, 2 1/2¢ @ 2 3/4¢; Shell, 2 5/8¢; Flange, 3 5/8¢; Fire-Box, 4 25/8¢; Steel Plates, Flange, 3 5/8¢ @ 3 7/8¢; Fire-Box, 4 25/8¢.

Structural Iron.—There has been nothing of importance done during the past week, and the prospects for the near future are not very encouraging. Requirements for 5000 or 6000 tons of Bridge Iron have been on the market, but the terms of payment proposed are not likely to meet with ready acceptance. This feature of the market is somewhat strongly marked at present, and the recent defaults in car trusts and other securities have made sellers very cautious. Prices are about as quoted last week, viz: 2 1/4¢ for Angles, 2.20¢ @ 2.25¢ for Bridge Plate, 2.6¢ for T's and 3 5/8¢ for Beams and Channels, subject to the usual discount on large lots.

Sheet Iron.—The market is somewhat irregular, but, on the whole, is perhaps in as good condition as could be expected at this season. A few large orders have been taken, but, as a rule, buyers seem inclined to hold off, in the hope of something better later on. Prices have been marked down a fraction, and, unless for very large lots, there is not much chance of anything below the rates now current. Small lots about as follows:

Best Refined, Nos. 26, 27 and 28.....	3 5/8¢
Best Refined, Nos. 18 to 25.....	3 1/4¢
Common, 1/4¢ less than the above.....	5 1/2¢
Best Bloom Sheets, Nos. 26 to 28.....	4 5/8¢
Best Bloom Sheets, Nos. 16 to 21.....	4 1/4¢
Blue Annealed.....	2 1/4¢
Best Bloom, Galvanized, discount.....	5 7/8¢
Second quality, discount.....	6 1/4¢
Common, discount.....	6 3/4¢

Wrought-Iron Pipe.—There is considerable inquiry for Pipe and a fair amount of business doing, but prices show no improvement. Boiler Tubes are in good demand, and, on the whole, the outlook seems to favor a steadily increasing business. Discounts somewhat irregular, but in most cases are about as follows: Butt-Welded Black Pipe, 45 %; Butt-Welded Galvanized, 30 @ 35 %; Lap-Welded Black, 60 @ 65 %; Galvanized, 40 @ 45 %; Boiler Tubes, 57 1/2 @ 60 %.

Steel Rails.—The demand is not active, but prices are held with a good deal of firmness. A fair degree of activity is reported in small lots at from \$28 to \$28.50 at mill, but large buyers show no disposition to come in at current quotations. Concessions of probably about 50¢ per ton might be obtained on very desirable orders, but that appears to be the extreme limit, although buyers talk \$26 @ \$26.50 for 5000-ton lots and upward. Manufacturers claim that less than \$27.50 would be so much dead loss, so that it is probable that buyers will have to increase their bids if they intend to place orders.

Old Rails.—Only a limited business can be reported, as the offerings are light and buyers not particularly urgent at the prices at which Rails are held. Sales during the week at \$17.50, Philadelphia, and \$18 @ \$18.50, delivered at points a short distance in the interior. Holders ask about half a dollar more money, but buyers refuse to advance their bids.

Scrap Iron.—There is not much demand, and prices are barely steady, except for choice qualities: No. 1 Wrought at \$18 @ \$19, according to selection and delivery; Machinery Cast, \$14.50 @ \$15; Wrought Turnings, \$14.50; Cast Turnings, \$9.50 @ \$10.

Nails.—There is but little change to notice, the demand being fair for the season. As a rule \$2 @ \$2.10 is quoted for Iron Nails, and 5¢ @ 10¢ more for Steel Nails, but there is a good deal of cutting when large lots are taken.

Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue,
Pittsburgh, Pa., January 13, 1885.

The general Iron situation has undergone but little change during the past week, though a more hopeful feeling appears to prevail in some quarters. On the other hand, one of our oldest mill owners, encountered on the street by your correspondent yesterday, said that the Iron business was exceedingly flat, and that he could see but little prospect of any immediate improvement. There is a good deal of complaint being made by our manufacturers in regard to railway transportation; while admitting that rates are low, they claim that in order to meet competition in some sections of the country everything is being shaved so close that the matter of transportation is more important than ever before, as it frequently settles whether an order is to be placed here or go elsewhere. Railroad managers say they are down about as low as it is possible to go in the matter of rates, but many of our manufacturers aver that, in order to meet competition, they must have still lower freight rates. The rates from Pittsburgh to the Pacific coast have been reduced of late, the effect of which will be to increase our trade with California and Oregon.

Iron Ore.—Advices from the Lake Ore region continue of an unimportant character; there, as elsewhere, business is exceedingly dull and the outlook discouraging. One of our Pittsburgh furnacemen, who has just returned from a trip through that section, reports that so far as he could learn there have been no sales made for future delivery, and that no price has as yet been established. It is pretty evident, however, that the price will be lower this year than it was in 1884. Some people claim that the Ore companies had the best part of the Iron business last year.

Pig Iron.—There has been nothing of importance developed during the past week. Business continues dull, and it is not likely that consumers will feel like departing from

the hand-to-mouth policy until there has been some improvement in the market for the products. It is intimated, however, that some round lots could be placed at a reduction of from 50¢ to \$1 per ton on present rates, but, so far as we can learn, there are no sellers at the reduction. Best Neutral Mill Irons can be bought at \$15.50 @ \$15.75, cash, for present delivery, but we doubt whether contracts could be made for delivery two or three months hence at the prices quoted. Furnacemen say there is no margin for profit at rates now ruling, but those of them whose furnaces are in operation prefer to sell to blowing out, hoping that in the meantime there will be a change for the better. Of the 12 city furnaces 5 are out of blast, and those in blast are nearly all working on contracts, and have little or no stock. Prices may be fairly quoted as follows:

No. 1 Foundry.....	\$18.00 @ \$19.00, 4 mos.
No. 2 Foundry.....	14.00 @ 17.00, 4 "
Gray Forge Neutral.....	15.75 @ 16.00, 4 "
White and Mottled.....	14.50 @ 15.00, 4 "
Silvery, as to quality.....	16.00 @ 18.00, 4 "
Charcoal Hot-Blast.....	22.00 @ 25.00, 4 "
Cold Blast, Charcoal.....	25.00 @ 27.00, 4 "
Bessemer Iron.....	18.00 @ 18.50, 4 "

Muck Bar.—There appears to be nothing doing. No sales reported for a considerable time, in the absence of which we quote, nominally, at \$27.50 @ \$28, cash.

Manufactured Iron.—Trade in all kinds of Finished Iron continues dull. A good many orders are sent here, but placed elsewhere, our manufacturers refusing to take them at the prices offered at competing points. There are nearly always some mills whose financial necessities compel them to run at the best rates they can obtain, and these, for the reason stated, are getting the most of the business in consequence of underselling other mills that refuse to accept prices which do not cover cost of production. Our Pittsburgh manufacturers continue to quote on a basis of \$1.65 @ \$1.75 rates for Bars, 60 days, 2 % off for cash, but, as already intimated, buyers can do considerably better elsewhere.

Nails.—There has been some inquiry the past week, but it is believed more with the view of feeling the market than buying. It is not expected that there will be much business before next month, January being usually a dull month in Nails. Nearly all the factories here are still standing idle, and the indications are that there will not be much done for several weeks to come. Prices remain unchanged at \$2, 60 days, 2 % off for cash in car lots. Steel Nails are still quoted 5¢ to 10¢ per keg above Iron Nails, but where competition is close they are being sold at same price.

Wrought Iron Pipe.—The dullness noted for some weeks past continues, and there is not likely to be much, if any, improvement until the spring trade opens up. There is an occasional inquiry, but it is more with a view to feeling the market than anything else. Prices continue irregular and unsatisfactory. Ever since the collapse of the combination each mill has been at liberty to make its own price. Discounts on Black Butt-Welded Pipe, 45 @ 45 and 5 %; on Galvanized do., 35 %; on Black Lap-Welded 65 @ 65 and 5 %; on Galvanized do., 45 @ 45 and 5 %. Selected Pipe, or Pipe cut to specified lengths, discount 5 % less than rates quoted. Two-inch Oil-well Tubing, 11¢ @ 12¢ per foot, net; 5 1/4-inch Oil-well Casing, 38¢ @ 40¢ per foot, net.

Steel.—Trade is a little better, owing in large part to the reduction in the cost of skilled labor, which has enabled our manufacturers to reach out with more confidence, but there is still plenty of room for improvement. Prices remain unchanged. Standard makes Refined Cast Steel, 9 1/4¢ @ 10¢; do. Crucible Machinery, 5¢ @ 5 1/2¢; Open-Hearth and Bessemer do., 3¢. Steel Nail Slabs still quoted at \$30 per ton, on cars at works, but, as stated in our last report, a desirable order might be shaded.

Steel Rails.—There have been no sales here, and, what is still worse, little or no inquiry. Heavy Sections are still quoted at \$28, cash, at works. Freight from here to Chicago, \$2.52 per ton. The Edgar Thomson Works are still standing idle, and the managers thereof appear to have no idea as to when they will be started up again. The fact of the matter is there is no demand.

Old Rails.—The last sale of Old Iron Rails reported was at \$9, at which price the market is steady. Old Steel Rails are still quoted at \$16 @ \$17, according to lengths.

Crop Ends.—There have been no sales of Steel Rail Ends reported recently, in the absence of which we continue to quote at \$18, cash; Steel Bloom Ends are quoted at \$17 @ \$17.50.

Railway Track Supplies.—Continue exceedingly dull, and the prospect of improvement is not very encouraging. Prices nominally unchanged as follows: Spikes, 2¢ per lb, 30 days; Splice Bars, 1.65¢ @ 1.75¢; Track Bolts, 2 3/4¢ @ 2 1/2¢ per lb.

Scrap.—The dullness noted for some time past continues, and there is so little doing that it is difficult to give reliable quotations in consequence. No. 1 Wrought Scrap is still quoted at \$16 @ \$17, net ton; Wrought Turnings, \$14 @ \$15; Old Car Axles, \$24 @ \$25; Old Car Wheels, \$15 @ \$16 per gross ton; Cast Borings, \$11 gross.

Window Glass.—Is always dull at this season of the year; prospect fair for an average spring trade. Prices remain unchanged. Discounts remain as follows: Single Strength in car lots is quoted at 70 and 5 %; Double Strength, 70 and 10 and 5 %.

Coke.—Blast Furnace Coke remains unchanged at \$1.10 per ton, free on cars at ovens, with a very light demand.

Coal.—The river Coal trade continues in an exceedingly unsatisfactory condition; down-river markets all overstocked and very dull, and prospect for early improvement not good.

Chicago.

Office of The Iron Age, 36 and 38 Clark St.,
Cor. Lake St., Chicago, January 12, 1885.

Hardware.—Nothing of importance to note during the week. Buying was not indulged in to such an extent as to give evidence of a revival in business, and the movement of goods was in small quantities. Reports from travelers state that country dealers are not through with their inventories, and that they have not succeeded in making collections as rapidly as they had hoped. Mail orders at this season are not brisk. From information obtained from various sources, the present week promises better things, and it is confidently expected that henceforward there will be a steady increase in the demand. Prices on many lines of goods are being raked over, new lists adopted and changes made which at first sight appear important, but when the final result is computed the difference aggregates very little either way from the prices which prevailed during the latter part of 1884.

Barb Wire.—Inquiries for carload lots and larger quantities have been quite numerous during the week. Few sales are effected, however, considering the number looking after a supply for spring trade. There are many buyers who will be compelled to take stock before long, but they still hesitate in consequence of the unsettled state of affairs among manufacturers in some localities regarding price. During the last six weeks it has been expected that the price adopted by the St. Louis Wire manufacturers would become a standard for this locality. Latterly, however, there are indications that manufacturers are not a unit upon this point. During the week there was a lot of 100 tons sold, to be delivered in Texas, at figures which are variously reported from 4 1/4¢ to 4 1/2¢ for Galvanized and 1¢ less for Painted. Much competition was brought out on this lot, which gave evidence that manufacturers are likely to indulge in more cutting of rates than was expected. For the general run of trade quotations remain at 5¢ for Galvanized and 4¢ for Painted—figures that are said to be firmly adhered to for small quantities.

Nails.—The market is beginning to assume more activity. The increase in freight rates and the decision of makers not to sell Nails below present prices have brought into the market inquiries from all over the country for large and small lots. Many of the retail dealers are asking prices on carload lots for delivery, running half-way into the summer, and state their intention of buying within the next 10 or 15 days. The uniform price quoted by jobbers is \$2.05, 2 %, 60 days, for car loads, and \$2.10 in small lots from store. Track Bolts and Railroad Spikes have also been in good demand during the week, with numerous inquiries for later delivery. The market for these articles is stiffening, and the prospects of trade are daily improving.

American Pig Iron.—The market is rather quiet at present on actual orders, but is fully up to the trade of a year ago. Most of the buying during the week has been done in carload lots, while a few contracts, covering three or four months, have been made in Lake Superior Charcoal Irons. There seems to have been more inquiry for Coke Irons within the past 10 days than any of the other brands. The only important sale which occurred in this market was made by an outside party, aggregating from 1000 to 1200 tons of Mahoning Valley and Southern No. 2, at figures which could not be obtained. Southern Irons apparently are held pretty firm, without further reason visible than that the price is as low as they can afford to sell the Iron and have a profit, and that they concur in the belief that better prices can be obtained a little later on. The firmness which has characterized the market for several weeks on standard brands, has brought out several that had not been on the market when the better grades of Southern Iron were selling at lower figures. It is stated that, on account of the quality, these brands can be bought at \$17, four months, 50¢ below the price quoted as bottom on the better grades. This statement was calculated to temporarily weaken the market, but so far as we can learn no sales have been made at an off price. Prices appear to be pretty regular and very little disposition to favor consumers on the part of sales agents is shown. Concessions are not demanded by consumers. The only point they desire to be certain of is, that they are buying at a price which can be strictly regarded as the bottom of the market. Reports are circulated that there are one or two furnaces who are somewhat pressed for cash, and that there is a possibility of some lots being sold at special prices in order to relieve them of the load. In the present condition of the market there seems to be nothing that would change the price except some impending misfortune, which needs be averted by a sacrifice of price. It is also altogether possible that there are speculators enough waiting to take up anything that might be offered at a favorable figure, and thus avert breaking the price,

which we continue to quote in carload lots, four months, as follows: Lake Superior Charcoal, Nos. 1, 2 and 3, \$21.50; Lake Superior Coke, \$20 @ \$21; Cinder, mixed, \$19 @ \$20; Lake Superior and Ohio, mixed, \$20.50 @ \$21; Ohio Standard Black Band, No. 1, at \$21; Southern, No. 1, at \$18.50; No. 2 at \$17.50; Silvery Soft at \$17.50 @ \$19.50.

Scotch Iron.—The market remains in the same position as a week ago, with the exception that the demand has been slightly off. We renew our quotations on Summer-lee at \$25, cash, from yard.

Merchant Steel.—There is no change in the condition of the market for present consumption. Consumers are taking small quantities and the bulk of the trade is principally from local manufacturers. Like other branches, there are inquiries for future delivery, and prices taken for nearly all classes of Steel, but comparatively few contracts have yet been placed. The market cannot be said to have assumed any more regularity in price than has characterized it during the last three months. A settled scale of prices would very materially improve the demand and give confidence to consumers who are now holding off only because they have no assurance that figures prevailing will not be discounted. Estimates are being asked on from 10 to 20 and 50 ton lots and even more, but it is not probable that these orders will be placed for some time to come. We continue the following quotations for Best Refined brands from store:

Best Refined Cast Tool Steel.....	Per pound.
Crucible Cast Machinery Steel.....	5 1/4 @ 5 1/2
Open-Hearth Machinery.....	5 1/4 @ 5 1/2
Bessemer Machinery.....	5 1/4 @ 5 1/2
Open-Hearth Spring Steel.....	5 1/4 @ 5 1/2
Toe-Calk Steel.....	5 1/4 @ 5 1/2
Fire-Box and Boiler Steel.....	4 1/4 @ 5
Slid Shoe Steel, plain.....	2 3/8 @ 2 1/2
curved.....	2 5/8 @ 2 3/4
Synthetic Steel.....	5 @ 5 1/2

Steel Rails.—Some new life has been instilled into the Steel Rail market during the last week by the announcement that the North Chicago Rolling Mill will start up its Chicago branch on the 10th inst. Considerable inquiries for Rails are upon the market, but, so far as we can learn, orders are not being placed with any rapidity. For those that have been taken \$29 @ \$30 seems to be the bottom quotation, while it is suspected that there have been orders placed at less figures somewhere in the vicinity of Chicago. Railroads are holding off for the purpose of obtaining lower prices, but, from a maker's point, it will be a hard struggle before they will concede these demands. The price named is supposed to be the bottom figure for 1885, though the anxiety with which mills in some localities are seeking business may be the means of shading these prices 50¢ or \$1 per ton, but at the present time this is mere conjecture.

Old Rails.—The Old-Rail market during the week has been somewhat more active, though very few transactions are reported. Brokers are asking \$18 per ton, while mills seem unwilling to bid more than \$17. An offer of \$17 per ton was made for 1000 tons during the week, Milwaukee delivery, without having been accepted. Sellers and buyers are about \$1 per ton apart, and in the present condition of the market they are likely to remain so. Neither party seems willing to shade their figures. The market appears to be well supplied, and there are holders who are more anxious to realize than several weeks ago. Before the present week closes it is possible that some sales will be made at about \$17.50.

Structural Iron.—Inquiries are coming in more freely for building purposes. Building permits have recently been taken out for three or four 9 to 12-story buildings, and estimates are being asked from mills for these structures. There are also several bridge contracts in view with inquiries of from 300 to 400 tons, while there is other work in sight that will cover three to four months of the year, which gives considerable interest to the Structural Iron trade. No changes having been made in price, we continue the following quotations: Beams, \$3.60; Channels, \$3.60; T Iron, \$3; Angle Iron, \$2.50; Flitch Plates, \$2.50; Frieze Plates, \$2.70. 1/4¢ @ 1/2¢ is added for delivery from stock.

Bar Iron.—The local demand for Bar Iron during the week was considerably improved over that of the last six weeks. Inquiries of more than ordinary importance are daily received, and prospects of a busy season are growing brighter as the month grows older. Sales agents who have recently gone out to look after trade announce that the warehouses are greatly in need of replenishing, and they are meeting with more encouragement than was anticipated in securing orders at the present time. Dealers seem to realize that the price of Iron is very low and that they cannot expect further concessions. From store we renew our quotation at \$18.80 rates for Best Refined New Puddled Iron. Common Iron is somewhat stronger in price from mill, the lowest quotation during the week was \$1.50, f.o.b., while we have learned of one or two parties who have refused to sell below these figures. There are makers of Common Iron, however, who would be willing to accept a fraction off, but the difference is found in the quality. Consumers are not buying very freely. Store price on Common Iron is reported at \$1.70 @ \$1.75, which is perhaps a shade below what was heretofore considered bottom rates.

Norway Bars.—Importers have made a revision of prices in Norway Bars during the week and are now quoting \$4 rates to cit-

Trade Report.

General Hardware.

In some other lines of business an increased demand is reported, but Hardware merchants and manufacturers experience it to only a limited extent. More inquiries are coming in, some orders are being booked, but the volume of trade is not as yet up to expectations. There have not been many important changes in price announced by the manufacturers, nearly all that have been made being, as our readers are aware, in the way of reductions. On many lines of goods very low figures are now quoted, and the opinion is expressed by many that the bottom must be touched, though the long-continued decline makes such a view to be held with only moderate confidence. Manufacturers are still pursuing a careful and conservative course in restricting their production so as to avoid the accumulation of unduly heavy stocks. During the past month or two the consumption of goods has undoubtedly been in excess of the purchases by the trade, and stocks in dealers' hands are known to be exceptionally light. Collections in some sections are reported as slow and difficult, but the general financial situation is not regarded with apprehension. With the demand that will naturally set in before long, it is hoped that a better condition of things will soon be experienced and manufacturers and merchants be doing a fair and satisfactory trade.

BARB WIRE.

We are unable to report any considerable increase in business, although we understand that a moderate demand exists for small lots. Manufacturers continue to dwell hopefully on the favorable prospects for a good spring trade, and in the meantime they expect to maintain the present range of prices, which are now so low that there seems to be little danger of their receding any further. Some of the companies supplying this market have notified their agents to ask higher prices than they have been quoting for the past month. The indications are strongly in favor of the temporary withdrawal from the field of some of the establishments which have been competing very sharply for orders of late, the business secured being unremunerative. We continue to quote prices on the basis now established, which is as follows: Small lots of Galvanized Four-Point, delivered in New York, 5 cents to 5 1/4 cents per pound; Painted Four-Point, 4 cents to 4 1/4 cents. These prices are, of course, shaded for carload lots or over.

NAILS.

Owing largely to the limited number of Nail factories now in operation, and partly to the belief that prices are sufficiently low, buyers have been in the market during the past week for considerable quantities of Nails, and we hear of single sales running as high as 5000 kegs. The demand has come from all sections, including lots for shipment to California and for export. The consequence of this condition of affairs is that the factories which are still doing business are being filled with orders for some time in advance, and their agents are greatly encouraged by the outlook. The course of prices is not changed from what it has been, but it is claimed that they are not being cut so much as they were some time ago. We continue to quote \$2.05 @ \$2.10 for ordinary lots from New York store, with \$2 named as the figure for large lots. A very fair demand is noted for Steel Nails. Some orders have been taken for export. They are quoted at about 10 cents above the price of Iron Nails.

HENRY DISSTON & SONS, Philadelphia, have issued the following circular with reference to their discounts for the coming season, under date January 1, 1885:

PHILADELPHIA, JANUARY 1, 1885.
GENTLEMEN: We have adopted the following discounts for the season, commencing January 1, 1885, at which rates we shall be pleased to execute your orders, assuring you that our highest aim will be to maintain the reputation already established for our goods, and earnestly solicit the co-operation of the trade in the maintenance of the factory rates:

	Per cent.
Pages 8 to 11 inclusive.....	40
Page 16.....	40
Pages 12 to 27 inclusive.....	45
" 92 to 108 ".....	45
" 104 to 105 ".....	45
Page 106.....	50
Pages 84 to 91 inclusive.....	50
" 28 to 33 ".....	50

The above are the rates at which our goods will be invoiced, and are subject to a special discount of 10 per cent. if paid by the 20th of the month following date of purchase; if not paid by that date, will be subject to draft at sight, and if the same is not honored the discount will not be allowed.

Yours truly, HENRY DISSTON & SONS.
They also issue a circular of special Hand and Kitchen Saws, which they are prepared to etch to order, the circular giving cuts and descriptions of these Saws. These Saws are thus numbered and described, no prices being given:

No. 200, Cherry Handle, Polished Edged, 4 Brass Centennial Screws, full width, warranted and Cross Filed; 16, 18, 20, 22, 24, 26, 28 inches.....	net
No. 201, Walnut Handle, Polished Edged, 4 Raised Brass Screws, Steel Plate on handle, full width Blade, Cross Filed; 26 inches.....	net
No. 202, Black Handle, Polished, 4 Raised Brass Screws, Steel Plate, full-width Blade, Cross Filed, well finished; 26 inches.....	net
No. 203, Beech Handle, full width, 4 Screws; 16, 18, 20, 22, 24, 26, 28 inches.....	net
No. 106, Apple Handle, 4 Centennial Screws, full width, Close-up Handle, Grained Blade; 26 inches.....	net

No. 204, Walnut Handle, Polished Edged, 4 Raised Brass Screws, Steel Plate, well finished, set and sharpened; 16, 18, 20, 22, 24, 26, 28 inches.....	net
No. 205, Polished Black Handle, 4 Centennial Screws, full width, Close-up Handle, well finished; 26 inches.....	net
No. 206, Black Walnut Handle, Steel Plate with 3 Iron Screws; 26 inches.....	net
No. 207, Black Walnut Handle, 3 Iron Screws; 26 inches.....	net
No. 208, Beech Handle, Polished Edged, with 3 Screws, set and sharpened; 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32 inches.....	net
No. 209, Beech Handle, 3 Screws, set and sharpened; 30 inches.....	net
No. 210, Beech Handle, Polished Edged, 3 Plain Screws set and sharpened, 24-inch etched rule; 26-inch Saw.....	net
Same Saw; 20 inch.....	net
No. 211, Beech Handle, 3 Screws, set and sharpened; 16, 18, 20, 22, 24, 26, 28 inches.....	net
No. 212, Black Handle, Polished, 4 Brass Centennial Screws; 26 inches.....	net
No. 0 Kitchen Saws; 12, 14, 16 inches; in half dozen boxes.....	
Jackson Kitchen Saws, No. 00, 12 inches; in half dozen boxes.....	
Jackson Compass Saws, all sizes, 10, 12, 14, 16 inches; in half dozen boxes.....	
Saw Handles, 26 inches; Post Hole Diggers, Wood Saw Frame, Wood Saw Rods, Saw Cutters, Web Saw Frames.....	

THE STANLEY RULE AND LEVEL COMPANY, New Britain, Conn., and New York, issue the following discount sheet, under date January 1, 1885, there being an additional discount of 10 per cent. for cash within 30 days:

Catalogue pages.....	Discount per cent.
49, Awl Haft.....	45
49, Awl, Patent Pegging.....	45
50, Brad Awl, Handled.....	45
50, Bevels, Shading T.....	60
50, Patent Flush Raska.....	60
46, " L. Bailey's Patent.....	30
49, Box Scraper, Adjustable.....	30
46, " Scraper, "Victor" Adjustable.....	30
50, Chalk-line Reels and Awls.....	30
49, Carpenters' Foot Handles.....	30
56, Cattle Ties.....	30
49, Countersinks, Wheeler's Patent.....	30
29, Dado, Filletster, Plow, &c., combined.....	30
39, " Adjustable.....	30
39, " 30, Gauges.....	30
50, Handles, Brad Awl.....	30
51, " Plane.....	40
51, " Saw.....	40
51, " Screw-Drive.....	50
51, Hammers, Magnetic.....	50
54, " Tack, No. 4.....	30
55, " Steak.....	30
54, " Upholsterers.....	30
51, Level Glasses.....	70
52 & 53, Mallets, Hickory and Lignumvitae.....	70
41, Miter Box, Improved.....	10
24, " Squares, Improved.....	20
24, " Try Squares, Improved.....	20
18, Plumbs and Levels.....	20
19, " Patent Adjustable.....	70
30, " Nicholson's Patent.....	20
20, " Iron Frame.....	30
21, " Machinists.....	20
21, Pocket Levels.....	70
32 to 34, Planes, Bailey's Adjustable, Iron and Wood.....	70
35 to 37, Planes, the Stanley Adjustable, Iron and Wood.....	30
44 & 45, Planes, Leonard Bailey Co.'s "Victor" Adjustable.....	30
40, Planer, Reading.....	30
37, " Bull-nose Rabbit.....	30
40, " Rabbit and Filletster.....	30
40, " Woodworker's Handy Router.....	30
41, " Tonguing and Grooving.....	30
33, Plane Irons.....	30
40, Plow, Beading Tool, &c., combined.....	30
28, " Filletster, &c., combined.....	30
38, " Matching Plane, combined.....	30
47, Plumb Bobs, Adjustable.....	30
3 to 10, Rules, Boxwood, Stanley's.....	75
11, Rules, Ivory, Stanley's.....	50
14 & 15, Rules, Iron, Stanley's.....	50
14 & 15, " Miscellaneous, Stanley's.....	50
56, Sash Cord Irons.....	30
51, Screw-Drivers, Handled.....	30
51, " Screw-Drivers, Varied Handles.....	30
42 & 43, Spoke Shaves, Bailey's.....	40
42, Spoke Shave Cutters, Bailey's.....	40
46, " Shaves, "Victor".....	30
46, " Shave Cutters, "Victor".....	30
47, Trammel Points.....	25
48, Tool Handles and Tools, Excelsior.....	25
26, Try Squares.....	60
22, " Improved, Iron Handle.....	30
22, " Adjustable.....	30
25, " Inlaid.....	30
26, " Plumb and Level.....	30
25, " Square and Bevel, combination.....	30
23, " and Miter Square, Winterbottom's.....	30
51, Veneer Scrapers.....	30

TINWARE.

A better feeling is already manifested in the Tinware market, and there has been something of a strengthening of prices. The trade are awaiting with much interest definite announcements from the Central Stamping Company and developments as to the policy which they will pursue. The new company are in possession of their offices formerly occupied by James, Aikman & Co., 25 Cliff street, and are perfecting the details of their organization and busily at work on a catalogue and price list of their goods. There is no evidence of any movement on foot toward a general combination of the Tinware manufacturers, and reports which have been in circulation to the effect that the organization of this company is with a view to the establishment of a monopoly, are regarded as without foundation. The indications are that the Central Stamping Company have been formed with a distinctively business object, as the best way to check the excessive competition which has prevailed and secure remunerative prices. At the same time the extent of the production of outside manufacturers is such as to prevent an exorbitant advance. The hope is expressed that, as a result of the present condition of things, there will be for manufacturers of Tinware, if they are wise in availing themselves of the opportunity, a more satisfactory business than for some time past, at fair though not heavy profits.

The formation of the Central Stamping Company in this city is regarded by the manufacturers of Tinware in other parts of the country with much interest, and is usually considered as giving promise of a better condition of things in this line. Relating to this we make the following extract from a letter of a leading manufacturer:

We are not fully informed as to the plans and intentions of the Central Stamping Company, but in view of the fact that the Stamped Ware business has been ruined by overproduction and sharp competition, it seems but reasonable to suppose that the company was organized in the hope of placing the business upon a better basis, and we can but think much of the competitive strife will be done away with, the business

be under better control and we hope for better prices. We think the demand for cheap Tinware has, to some extent, cut off that for standard goods. Nearly every maker claims to make the best, and dealers and consumers who get the cheap goods may not know that there are any better manufactured. Our customers prefer standard goods, but want extremely low prices. As to the general outlook for trade, that is beyond our ken. We are hopeful, but not confident.

The views expressed in the following communication from another leading house will be of interest to the trade, who will be very glad to accept the somewhat hopeful view of the opening year which is given by our correspondents, both with reference to more remunerative prices and the demand for the better goods:

To the Editor of The Iron Age: It is very difficult to determine the effect of the formation of the Central Stamping Company until the policy of this concern shall be made known. Our impression is, however, that the price of many articles which have been sold at a loss for some time will be advanced to a paying price, and the object of this consolidation is evidently to secure some remuneration for the capital and talent employed in the business, which has not been the case since the dissolution of the Stamped Ware Manufacturers' Association. We sincerely hope that they will exert a salutary influence in this respect, as Stamped Ware and all other articles are being sold at such figures as are ruinous to prosperity. As to a general advance, we think this is out of the question in the present condition of the country. A moderate increase of prices is absolutely necessary, but a general advance would work ill by inducing outside capital to embark in the business and thereby increase competition. At present the country has more capacity for producing goods than the demand justifies, and to increase this would only make matters worse. Our experience is that trashy goods have had their day, and there is now a demand all along the line for goods of a better quality than even the "standard goods" now produced. The outlook seems to brighten, in view of the present status of things, and we believe the year 1885 will bring about a revolution greatly to the advantage of all in our line who will make the most of their opportunities.

Another house who have written us on the subject take substantially the same view of the situation, and find in the formation of the Central Stamping Company indications that the whole Tinware trade will be for a time in a more satisfactory condition:

I think prices for goods in our line will be higher and firmer this year than they were in 1883. Prices are now a little higher, and the feeling among buyers, so far as I am able to learn, is that they must pay more for goods. In my opinion, there is not more than 65 per cent. of American manufactured goods now on the shelves of our merchants throughout the country that were on hand one year ago, and I believe there will be a healthier condition of the trade this year than last. I think the prices of the Central Stamping Company will be maintained by all other first-class houses, and I believe the formation of the syndicate will be of widespread benefit in the Tin trade.

The following communication from a well-known concern refers, it will be observed, to the Tinware market in some of its more general aspects, and the views expressed with reference to the course of the Central Stamping Company will be regarded with interest. What is said with reference to the jobbing trade will command the attention of manufacturers and recall to the trade at large some of the annoying irregularities which have heretofore prevailed. It remains to be seen whether anything can be done to correct them. But the whole letter is interesting, and we take pleasure in laying it before our readers:

To the Editor of The Iron Age: The effect of the formation of the Central Stamping Company upon the Tinware trade is a very difficult problem to solve, as they are not yet under way, and any opinion expressed before they show what policy they intend to pursue is simply a conjecture. Judging from the character of the men composing the company, their facilities for manufacturing, the ample capital at their command, and their thorough knowledge of the entire trade, as well as the views expressed to the writer by a number of the active members of the company, the effect cannot but be beneficial to the entire trade, and will have a tendency to stiffen prices, not only on such goods as they have the exclusive manufacture of, but on the entire line of Tinware. I think the consolidation is an honest movement to put the trade on a more solid foundation, and make it possible for the manufacturer and jobber to make at least a slight profit on the goods sold.

I do not think there will be a general advance in prices immediately. The company will have to feel the general pulse of the jobbers throughout the country, and learn the general disposition of the manufacturers who are not in the consolidation, but I think, if they pursue a liberal course toward the legitimate jobber, and allow him a liberal margin, that the outcome will be, in the course of time, a general advance in the prices of Tinware. The Central Stamping Company should confine its business entirely to jobbers, and not enter into competition with them; especially should they not quote the very smallest trade jobbers' rates, or quote them at all. On this point of selling jobbers only, they should not pick out the largest retailers, the cream of the retail trade, and call them jobbers, and leave the skim milk for the legitimate jobber. If the jobber will sell his goods at cost to the large retailer, that is none of the business of the manufacturer, so the jobber pays his bills satisfactorily. My impression is that the Central Stamping Company will be equal to the occasion.

Cheap Tinware has its field as well as better grades of goods; it goes where better goods cannot go. There is something popular and striking to the average mind in the idea of buying a thing because it is cheap,

There are thousands of dollars worth of Tinware bought that would not be thought of by the purchaser if they were first-class and even medium-priced. Cheap tinware, however, interferes with the demand for standard goods, on account of the ignorance of the consumer, the vast majority of purchasers looking at price only, and if a better article is quoted at a higher price, the lower-priced article is almost always purchased with the belief that it is equivalent to the better goods, and in many cases the dealer unjustly acquires the reputation of being high-priced simply because he gives better goods for a little more money. Of course we all know "the best is the cheapest," but not till the millennium comes will everybody buy the best goods and pay a fair price for them. My experience is, that if you want to build up a large trade you will have to keep every grade and quality of goods to suit every class of trade, and this requires capital, large warehouses, plenty of help, large expenses, plenty of hard work, and, perhaps, a small profit if managed properly and no bad debts are made.

The general outlook for trade is not very encouraging. I think that trade will be very light this spring, and next fall we will see a slight revival of trade. With the present prices for goods, I think it will pay every retailer to lay in a full stock, and by so doing they will make money.

SCREWS.

The different Screw lists before the trade are being carefully scrutinized and cause some confusion and uncertainty, which are probably increased by doubt as to the course the Dayton Screw Company will adopt. We hear from the trade directly and through our correspondents of more or less dissatisfaction and impatience because of this condition of things. It will be observed that our Louisville correspondent, whose communication our readers always find interesting and worthy of careful perusal, refers to the necessity for uniform lists, and characterizes the variation existing as childish and unworthy the large and dignified concerns engaged in the manufacture of Screws. Another correspondent, whose letter is before us, and who represents the retail trade, refers to the matter in this way:

We fail to see what need there was of changing the Screw list at all. We deprecate the practice of manufacturers in changing their lists so often, notably Screws and Carriage Bolts. Retailers no sooner learn to remember the list of leading sizes than out come the manufacturers with a new list, and then every time we sell a package of Bolts or a gross of Screws we must look up the list. By the time we get the hang of the new one the manufacturers are ready with another change. Now, to make matters worse and more confusing, we have two lists of Screws each with their own discount. Common courtesy to the trade demanded that the Russell & Erwin Mfg. Co. should have adopted the same list as the American Screw Company, but as several manufacturers have already adopted the Russell & Erwin Mfg. Co.'s list, we hope the American Screw Company will magnanimously follow suit. At the present time we prefer the American list as it is more easily calculated. We differ with "Hardware" in your last issue, in desiring to have a net list or nearly so. We think lists should be made so to allow the retailer from 40 to 60 per cent. off. But, at any rate, give us a list that will stay—one that will keep. Lists of all kinds are too easy of access and too public for consumers to have them net or nearly so. Very often the retailer must show his catalogue to a customer in order to let him see a cut of goods or for other reasons, and we find it hard to get lists where there is but a nominal discount on the article. Most people have the idea that there is about 80 per cent. discount on all goods. We think the list should be so that the retailer can sell a trifle more or less below the list and still have a fair profit.

The communication thus referred to, which appeared in our last issue, with reference to a net or rather a low list has received some attention from the trade. A Hardware man in Indiana intimates that it seems to be a hard matter for all the manufacturers to unite on one list at the present time, but expresses his hearty agreement with the suggestion of our correspondent that a lower list, and one that the retailer could sell from net would be more agreeable to the trade. He adds that it is particularly hard for a new clerk who does not thoroughly understand discounts to give the net prices to a customer on a gross of screws at sight.

From another Hardware merchant in this State we have the following letter, in which it will be perceived that the same suggestion is repeated and enforced:

To the Editor of The Iron Age: As a retail dealer I agree with the communication signed "Hardware" in your Trade Report of January 8. I prefer a Screw price list and all other price lists of Hardware, so that the discounts to the retail trade would be 25 per cent. Perhaps at this time, considering the present value of goods, it would be impossible to make lists from which that discount could be given for any great length of time. But lists could be made with a present discount of 40 or 50 per cent. and discount reduced as values increase. Of course, manufacturers make lists which they think will be convenient for themselves and for the trade. I have no doubt that if dealers expressed a desire for more convenient lists, the manufacturers would furnish them. I hope the trade will avail themselves of your invitation and let their views be known.

RETAILER.

But as arguing against the suggestion that a low list would be more convenient for the retailer, we have the following from a Kansas Hardware man:

To the Editor of The Iron Age: In reply to "Hardware" in last week's issue, I would ask him what harm there is in high lists? He does not point this out, but gives impracticable reasons for low lists. He wants a list which is net, or nearly so, for retailers'

benefit, which in one fell swoop would be disastrous. For instance, let a list be gotten up based upon a price at which Screws could be sold the retailer at 25 per cent. off. Very well; this works O. K. for a few weeks until a material change takes place in values and the goods go to, say, 10 per cent. off. What does he propose to do? Still sell at list, or ask the manufacturer to get out a new list every time such changes take place, entailing a great expense (for the purchaser to pay eventually), when with a high list one little figure does the whole business? Which is better—for "Hardware" to use a high list (in which there can be no harm) or compel houses issuing catalogues to have them defaced by constant list changes? Again, bill clerks become familiar with lists, and constant changes annoy and retard them. Give us high lists susceptible of withstanding fluctuations. It is as easy to figure large as small discounts, and Hardware must have time hanging wearily upon him to suggest more work for the already overburdened.

HARDWAREMAN.

With reference to the revised Screw list one manufacturer bluntly expresses the opinion that the necessity for it existed only in the imagination of the American Screw Company, and another company criticizes its publication, intimating that they do not feel disposed to follow it because they think the other companies should have been consulted before such an important step was taken. They also refer to the fact that the list of December 27, 1882, which has thus been superseded, was adopted by the manufacturers and so graded as to prevent the importation of the smaller-sized Screws, intimating that whenever the price of Screws advances to what it ought to be, that it is likely this new list will have to go, and the old list be called into requisition again. It will, however, naturally occur to our readers that, as there is no immediate prospect of such an advance in the price of Screws, it is wise policy for the manufacturers to see to it that they receive remunerative prices for the small sizes, which constitute so large a proportion of the goods sold. We may add that the Keystone Screw Company, Philadelphia, authorize us to state that they have adopted the Russell & Erwin Mfg. Co.'s list and made their discounts to conform, and that the Dayton Screw Company have not yet announced what course they will pursue. The probability is that they will have a different list from both of those now before the trade.

But as relating to the respective claims of the two lists the following letter from a well-known and highly esteemed jobbing house will interest our readers:

To the Editor of The Iron Age: Being a jobber in Hardware, and, consequently, a dealer in Screws, I was pleased to read in your paper dated January 1 the announcement of the issue by the American Screw Company of a new price list of Screws based upon the present cost of production, and I was surprised upon looking over your paper, dated January 8, to learn that six manufacturers, competitors of the American Screw Company, had adopted a different price list of Screws. What is to be gained by the issuing of two lists I have been unable to learn, but have found general disapproval of it. The American Screw Company had been for a long time determining the actual cost of manufacturing Screws, and issued the new price list in the interest of all makers, and instead of their competitors giving "credit to whom credit is due," we find them actually plagiarizing the brainwork of the American Screw Company by simply adding 33 1/2 per cent. to their list of Iron Screws, and 50 per cent. to their list of Brass Screws, and then giving discounts which net the same as those of the American Screw Company. As the American Screw Company were the first to issue a new price list, the trade should compel the adoption of it by all Screw manufacturers, as the animus is shown on its face in the adoption of the second list. "Anything to beat old Grant."

PRO BONO PUBLICO.

To nearly the same effect is the following communication, which comes to us from a hardware man who has evidently scrutinized carefully the competing lists:

To the Editor of The Iron Age: We notice you call for correspondence on the subject of price lists for Wood Screws. The inconvenience to the dealer in having more than one list is great, and attended with much confusion. The list adopted by the Russell & Erwin Mfg. Co., and later by some other manufacturers, simply adding 33 1/2 per cent. to the American Screw Company's list for Iron, and 50 per cent. to the Brass list, and then making the discount for Flat Heads 85 per cent., nets to the purchaser the same as the American Screw Company's quotation of 80 per cent. from their list for Iron, and 75 and 10 per cent. for Brass. As the Russell & Erwin Mfg. Co. adopted the American Screw Company's subject matter so literally, even to the supplementary sizes, which are new to them, I do not see what they have gained, beyond the unfavorable criticisms of the trade. Can you throw any light upon the matter?

ENQUIRER.

But while our correspondents argue in favor of the American Screw Company's list, and explain the very simple method by which the competing list with the appropriate discount is made practically the same list, the trade will see the occasion for congratulation that after all we have substantially one list. If the Russell & Erwin Mfg. Co. had issued a list that was made on a new and independent basis, so that some Screws came, for example, cheaper and others dearer than as per the prices of the American Screw Company, how much worse would be the situation than it is. That while ostensibly there are two, there is practically but one Screw list before the trade is a fact which may be regarded with satisfaction. It may be hoped that before long that one of these or some new list will be accepted by all the companies.

Just as we go to press we learn that the DAYTON SCREW COMPANY will issue to-morrow a new list, commencing with 11 cents, and subject to a discount of 33 1/2 per cent., with the same extras as may be given by the other manufacturers. From the manner in which this announcement is made, it is inferred that this list is based upon those now before the trade, but as we have not seen it we cannot give our readers further information than that contained in the above announcement.

FILES.

The condition of the File market shows no signs of improvement, and prices are very low. Some of the best makers refuse to meet prevailing quotations, and as a result their sales are somewhat diminished. The volume of trade last year is referred to by one manufacturer as satisfactory, but prices as having been the reverse, the opinion being expressed that very few manufacturers of Files made any money. An early revival of trade is anticipated by our correspondent, who would like to see a legitimate advance in the price of Files, not by combinations, but by the law of supply and demand. Combinations are, he remarks, formed and run by a few individuals, and prices advanced irrespective of material or labor, while any manufacturers who will not enter are regarded as legitimate targets to be fired at and "froze out." In the File trade, he continues, this thing has exhausted itself, and we predict it will be a long time before another File manufacturers' combination will appear.

In the present condition of things, the trade will do well to consider carefully the quality of the goods they purchase, and not fall into the blunder which is so natural to an American hardware man, of buying a given make of goods merely because they are cheap. The best Files probably cannot be made with a profit at the low quotations which prevail in the market, and it will unquestionably be the wiser policy for hardware dealers to purchase good, honest Files that will give satisfaction to the mechanics that use them. Referring to the File market, another well-known manufacturer says:

Regarding the condition of business, our experience has taught us that about 33 1/2 per cent. of the demand fell off during the past year, although we have not suffered to that extent, but only a very small percentage. In the matter of prospects, we look for the average spring trade, perhaps a lean average; but, by diligence, and taking into account the small stocks on hand, we hope to suffer but slightly.

Our readers have learned to appreciate and value the weekly review of the Louisville market which is given by

W. B. BELKNAP & CO.,

and always find in it serviceable information, and enjoy the facious points which are so frequently and so well made. Their communication this week has an additional feature of interest in the comparative table of wholesale prices for December, 1881, 1882, 1883 and 1884.

THE NIMICK AND BRITTON MFG. CO., Pittsburgh, Pa., for whom John H. Graham & Co. are agents, 113 Chambers street, New York, announce their new Burglar-Proof Attachment for Rim and Mortise Locks, the patent for which is now pending. This attachment they describe as a new and efficient device just invented, and manufactured only by them, which they can attach to any of their Locks when so desired. It is adjusted to the Lock-bolt, and, when secured on the inside, the key cannot be turned nor the bolt operated or picked by the burglar on the outside by skeleton key or any instrument used for that purpose. This attachment can be adjusted to their commonest and cheapest Locks, making them, they claim, more secure than expensive Door Locks without the attachment. They are now manufacturing a full line of Rim and Mortise Locks with the Burglar-Proof Attachment, giving them special numbers and list prices, but they call attention to the fact that the extra net price is very little above that of the ordinary Locks, and express confidence that after the Burglar-Proof Attachment Locks have been once used they will take precedence over the others. The following Locks with Burglar-Proof Attachment are thus offered to the trade, the list being subject to the regular discount of 70 per cent.:

Upright Rim Locks.		Per doz.
No. 2210, 4 1/2 in. Iron Bolts, Tinned Malleable Iron Key.		\$ 7.00
No. 2260, 4 1/2 in. Iron Bolts, Nickel-Plated Steel Key.		10.00
No. 2270, 4 1/2 in. Brass Bolts, Nickel-Plated Steel Key.		16.00
No. 2210, 4 1/2 in. Iron Bolts, Tinned Malleable Iron Key.		12.00
No. 2260, 4 1/2 in. Iron Bolts, Nickel-Plated Steel Key.		14.00
No. 2270, 4 1/2 in. Brass Bolts, Nickel-Plated Steel Key.		19.00
No. 3410, 5 in. Iron Bolts, Tinned Malleable Iron Key.		30.00
No. 3460, 5 in. Iron Bolts, Nickel-Plated Steel Key.		32.00
No. 3470, 5 in. Brass Bolts, Nickel-Plated Steel Key.		35.00
Horizontal Rim Locks.		
No. 4010, 4 1/2 in. Iron Bolts, Tinned Malleable Iron Key.		7.00
No. 4160, 4 1/2 in. Iron Bolts, Nickel-Plated Steel Key.		10.00
No. 4170, 4 1/2 in. Brass Bolts, Nickel-Plated Steel Key.		16.00
No. 4610, 4 1/2 in. Iron Bolts, Tinned Malleable Iron Key.		12.50
No. 4660, 4 1/2 in. Iron Bolts, Nickel-Plated Steel Key.		14.00
No. 4670, 4 1/2 in. Brass Bolts, Nickel-Plated Steel Key.		20.00
No. 5010, 5 in. Iron Bolts, Tinned Malleable Iron Key.		14.00
No. 5060, 5 in. Iron Bolts, Nickel-Plated Steel Key.		17.75
No. 5070, 5 in. Brass Bolts, Nickel-Plated Steel Key.		21.00
No. 5100, 5 in. Iron Bolts, Nickel-Plated Steel Key, Wrought Inside.		22.00
No. 5170, 5 in. Brass Bolts, Nickel-Plated Steel Key, Wrought Inside.		27.30

Mortise Locks.

	Per doz.
No. 10,610, 8 1/2 in. Lacquered Iron Front and Bolts, Tinned Malleable Iron Key.	\$11.00
No. 11,060, 8 1/2 in. Lacquered Iron Front and Bolts, Nickel-Plated Steel Key.	14.00
No. 11,070, 8 1/2 in. Lacquered Iron Front, Brass Bolts, Nickel-Plated Steel Key.	17.00
No. 11,160, 8 1/2 in. Brass Front, Iron Bolts, Nickel-Plated Steel Key.	20.00
No. 11,170, 8 1/2 in. Brass Front and Bolts, Nickel-Plated Steel Key.	22.00
No. 11,410, 4 in. Lacquered Iron Front and Bolts, Tinned Malleable Iron Key.	13.80
No. 11,860, 4 in. Lacquered Iron Front and Bolts, Nickel-Plated Steel Key.	16.60
No. 11,870, 4 in. Lacquered Iron Front, Brass Bolts, Nickel-Plated Steel Key.	18.70
No. 11,960, 4 in. Brass Front, Iron Bolts, Nickel-Plated Steel Key.	22.00
No. 11,970, 4 in. Brass Front and Bolts, Nickel-Plated Steel Key.	24.00
No. 12,210, 4 1/2 in. Lacquered Iron Front and Bolts, Tinned Malleable Iron Key.	29.50
No. 12,260, 4 1/2 in. Lacquered Iron Front and Bolts, Nickel-Plated Steel Key.	31.60
No. 12,270, 4 1/2 in. Lacquered Iron Front, Brass Bolts, Nickel-Plated Steel Key.	33.70
No. 12,280, 4 1/2 in. Brass Front, Iron Bolts, Nickel-Plated Steel Key.	35.80
No. 12,270, 4 1/2 in. Brass Front and Bolts, Nickel-Plated Steel Key.	38.60
No. 12,670, 5 in. Brass Front and Bolts, Nickel-Plated Steel Key.	51.20

Genuine Bronze Mortise Locks.

	Per doz.
No. 81,370, 3 1/2 in. Bronze Front and Bolts, Nickel-Plated Steel Key.	27.50
No. 82,170, 4 in. Bronze Front and Bolts, Nickel-Plated Steel Key.	30.80
No. 82,370, 4 1/2 in. Bronze Front and Bolts, Nickel-Plated Steel Key.	40.40
No. 82,670, 5 in. Bronze Front and Bolts, Nickel-Plated Steel Key.	53.50
Egyptian Bronzed (Iron) Mortise Locks.	
No. 91,370, 3 1/2 in. Egyptian Bronzed Fronts, Brass Bolts, Nickel-Plated Steel Key.	24.00
No. 92,170, 4 in. Egyptian Bronzed Fronts, Brass Bolts, Nickel-Plated Steel Key.	27.00
No. 92,370, 4 1/2 in. Egyptian Bronzed Fronts, Brass Bolts, Nickel-Plated Steel Key.	36.00
No. 92,670, 5 in. Egyptian Bronzed Fronts, Brass Bolts, Nickel-Plated Steel Key.	48.50

In their circular the same manufacturers call attention to Mathes' Patent Burglar-proof Sash Lock, an article favorably known to the trade, to the special points of which they call attention.

SAMUEL A. HAINES.

83 Chambers street, New York, has been making an important addition to the line of his agencies, as he becomes the representative of Hubbard, Bakewell & Co., the widely-known manufacturers of Axes, Saws, Hoes, Shovels, Drain Tools, &c., Pittsburgh, Pa. Being thus employed for the sale of their goods, it is announced to the trade that Mr. Haines is authorized in all cases to give the manufacturers' most favorable terms on the whole line of their manufactures. The trade will also learn with interest that the Hartman Steel Company, Beaver Falls, Pa., manufacturers of Steel Wire and Wire Nails, have also appointed Samuel A. Haines, 83 Chambers street, New York, as their representative. By this arrangement Mr. Haines is authorized to take orders for the entire line of their manufacture, and to give their best terms. We understand that in order to adequately represent to the trade the manufacturers for whom he is agent, Mr. Haines has found it necessary to engage the services of another traveler.

MARKETING GOODS.

The following communication from the Manhattan Hardware Company, with reference to their recently-adopted plan for selling their goods, will be of interest to manufacturers who are considering the best methods for accomplishing the sale of their productions as well as to the trade at large. Many who will not see their way clear to making a radical change in such a matter, will be interested in the experience of others in that direction:

READING, Pa., January 9, 1885.

To the Editor of The Iron Age: We would like to answer, through the medium of your valuable paper, the many inquiries that we receive from all sections at home and abroad why we will not sell jobbers at less than quoted prices for our goods in quantities less than \$1000. Our answer is, that we recognize no jobber unless his order exceeds \$1000, then we will give him special figures on application. We have established the rule of quoting net bottom prices for all goods made by us, and limiting the time for which prices are good, and the great increase in our sales has proven beyond a doubt that that is the only fair way of doing business between man and man, and gives the best satisfaction. We endeavor to make prices as low as can be made for the same class of goods by other manufacturers, and will advance or decline only when necessary.

MANHATTAN HARDWARE COMPANY.

The following is the price list of Sperry's Knife Sharpener, made by

SLATE & SPERRY,

Hartford, Conn., of which a description is given on page 31, under the head of Hardware Novelties, information with reference to the discount being given below:

	Price per doz.
No. 1, is Horn Handle, very handsome in variety of colors.	\$6.00
No. 2, is Jet Handle, matches Rubber-handle Carver.	6.00
No. 3, is White Handle, matches Ivory or Bone Handle Carver.	9.00
No. 4, is Red Handle, matches Red-wood Handle Carver.	9.60
No. 5, is Green Handle, will contrast with all kinds.	9.00
No. 6, is Plain-Wood Handle, and is intended for kitchen use.	3.00

All except No. 6 are tastefully put up with regard to the convenience of the trade and the attractiveness of the goods, each in a separate and neat box, with full directions on inside of each cover. Six of these are put into a "nest" or outer box, making the package to contain a half-dozen. They are then packed in cases of six dozen each (or 12 packages), which will weigh, when ready to ship, 50 pounds each. The No. 6, for kitchen use, are put up one-half dozen in a box, each with a neat wrapper and directions. The cases are the same size as the other numbers, but contain 12 dozen, or 24 packages, and weigh, complete, 70 pounds. The discount to the trade on the above list is 30 per cent. for one case lots, net cash in 30 days, with 1 per cent. extra discount for

cash in 10 days, or 2 per cent. extra discount for spot cash or money with order; all goods f.o.b., and for lots of less than one case 25 per cent. discount. The manufacturers mention that while their cases are calculated for ordinary demand six dozen each, except No. 6 which contain 12 dozen each; but to parties who are disposed to test the article they announce that they will forward, as sample, a single box containing a half a dozen, by express prepaid, on receipt of price, as per list given herewith, less 25 per cent. discount; or they will send a single Sharpener of No. 1 or 2, by mail prepaid, on receipt of 50 cents, or a No. 6 on receipt of 25 cents, simply that the trade may be satisfied by a practical test that this Sharpener is just the article needed.

MISCELLANEOUS PRICES.

There are indications that the prices of Planes recently established by the manufacturers are not being adhered to by some of the jobbing houses, an extra 5 per cent. being given more or less freely on small orders.

The Morris Sash Lock Mfg. Co., Cincinnati, Ohio, have issued the following price list for the "Triumph" Sash Lock, an article which they have just put upon the market, the list being subject to a discount of 60 per cent.:

No.	Per doz.
20. Plain Iron, Japanned, with Iron Rivet.	\$ 1.50
21. " " " " " " " " " " " "	1.75
22. " " " " " " " " " " " "	1.75
Rivet and Drop.	2.75
23. Plain Polished Bronze Metal, with Bronze Rivet and Drop.	8.50
24. Plain Polished Bronze Metal, Nickel-Plated Rivet and Drop.	10.00
25. Ornamental Iron, Tucker Bronze, Solid Bronze Rivet and Drop.	3.00
26. Ornamental Solid Bronze Metal, Bronze Rivet and Drop.	4.00
27. Ornamental Solid Bronze Metal, Bronze Rivet and Drop, Dark In'd, No. 3 Finish.	10.00
28. Plain Polished Iron, Brass Rivet, Boston Finish.	6.00
29. Plain Iron, Lacquered, with Iron Rivet.	1.75
One dozen in box. Packed with Screws, except Nos. 20, 21, 22.	

The list price of the Ice Tool, manufactured by the Acme Shear Company, Bridgeport, Conn., and described among our Hardware Novelties, on page 31, is \$55 per gross, subject to a discount of 50 and 10 per cent. Morse & Wolf, Morse's Novelty Works, 13, 15 and 17 Franklin street, New York, are making the Novelty Sanitary Water Filter Faucet, the retail price of which is \$5, but which is sold to agents and the trade at \$36 per dozen, net. In their circular which describes this article, its various points of excellence are mentioned and the advantages it possesses enumerated.

A reduction of about 1/2 cent. per pound has recently been made in the price of Peter Wright's Anvils. Blacksmiths' Drills are quoted in Chicago at \$1.50 to \$1.75, net.

The Winchester Repeating Arms Company have reduced their list on Rifles, making the new discount 25 per cent.

OAKUM.

The manufacturers of Oakum have entered into a combination for the manufacture and sale of Oakum, and have adopted the following prices, which are announced under date January 9:

Best Oakum.	8 1/2
U. S. Navy.	7 1/2
Navy.	6 1/2

The above prices are subject to a discount of 1/2 cent per pound on orders of 100 bales or over. Terms 60 days, or 1 1/2 per cent. discount for cash in 10 days. The present supply of Sial and Manila Hemp is unusually limited, and, with little to arrive, prices are firmer and an advance on Manila is expected.

CATALOGUES, &c.

Mast, Foss & Co., Springfield, Ohio, have issued a catalogue showing the Iron Turbine Wind Engine, of which they are the manufacturers, and also their line of Wind-Engine Pumps, Deep-Well Pumps, &c. This catalogue, which is uniform in size with the one which we recently noticed, exhibits another department of their manufacture. It illustrates fully the construction of their Wind Engine, and gives directions for setting it up and using it. It also gives a description, with cuts, of their Pumps.

We are in receipt of a catalogue and circulars relating to Pumps, Fire Engines, &c., which are made by the Gleason & Bailey Mfg. Co. (formerly the Cowing & Gleason Mfg. Co.), Seneca Falls, N. Y., and 20 West Houston street, in this city. Their catalogue is devoted to Pumps, Hydraulic Rams, Garden Engines, &c., of which cuts and list prices are given. They also call attention in separate circulars to their Rotary Pumps, Fire Engines and other fire apparatus. They have recently put on the market Bailey's Patent Multum in Parvo Saw Horse, a device that is intended especially for carpenters, stucco-workers, plasterers, lathers and masons. It consists of iron heads or ends which have sockets to receive different parts of the Saw Horse, so that with one pair of heads a horse of any height can be made and changed readily from a low to a high one. These heads can be carried in the tool chest. This article is described as much cheaper and stronger than the ordinary Horse.

John P. Lovell's Sons, Boston, Mass., issue in a separate circular a special list of Bean's Patent Police Equipments, illustrating and describing with prices Sole Leather Police Clubs, different patterns of Handcuffs, Chain Twisters, Police Hook and other goods in the same line.

Wiebusch & Hilger, manufacturers and importers, 84 and 86 Chambers street, New York, are about to issue a new catalogue, showing the line of German, English and

French Hardware and Cutlery, Guns and Gun Material, Chains, Anvils, &c., which they handle. It is about a third larger than their last, and very conveniently and compactly arranged, and fully illustrated, many of the cuts being new. It opens with a list of the houses, English, German, French and American, for which they are sole agents, and calls attention to the important lines of imported goods for which they are headquarters. The first 24 pages are devoted to English goods, exhibiting Peter Wright's Anvils and Vises, Armitage Mouse-Hole Anvils, a full line of John Wilson's goods, Brades's Trowels and other goods, Waldron's Scythes, &c., Butcher's Files, giving the new list for the first time that we have observed in a catalogue, Butcher's Tools, Wilkinson's Sheep Shears, Stubbs's Tools, Files and Gun Materials, and other English Hardware. The next department of the book is devoted to German goods, and opens with an exhibit of the manufactures of Hilger & Sons, Remscheid and Solingen, Germany, including Chains and full line of Pliers, and passing on to Hand Vises, Brace Bits, Stocks and Dies, &c., Sheep Shears, Razors and Strops, Hunting and Bowie Knives and other goods are also described. Among the American goods are those of the New American File Company, the Interchangeable Tool Company, and the Henry Seymour Cutlery Company. The catalogue closes with a complete and satisfactory index, and has a neat old-gold cover.

ITEMS.

The Champion Roller Skate and Wagon Company, Richmond, Ind., and the Northwestern Hardware Company, 92 Lake street, Chicago, and 101 Reade street, New York, issue a joint circular dated January 7, in which it is announced that the Northwestern Hardware Company are intrusted with the sale of the entire production of goods made by the Champion Roller Skate and Wagon Company, and it is requested that all communications and orders be addressed to them. In announcing this arrangement the Northwestern Hardware Company inform the trade that they are prepared to fill all orders for the Rowlett Star Roller Skates with reasonable promptness, and will carry a large stock for prompt delivery.

The Mining and Scientific Press, San Francisco, in a recent issue gives an illustration showing the exhibit made at the California State Fair by Huntington, Hopkins & Co. It is an exceedingly elaborate and effective display of a large line of Hardware, and evidences skill and taste in its construction and commendable enterprise on the part of the house.

George H. Packwood, of the firm of Morrison & Packwood, Tampa, Fla., has recently received a patent for a Carving Fork Guard, the object of the invention being to provide a simple and effective attachment to a Carving Fork, which, while serving as a Guard, can also be utilized for the purpose of sharpening knives. This is accomplished by combining a sharpening device with the guard and rest of the fork, the device consisting of two or more bars of steel transversely set in relation to each other, so that the edges of the steel bars at their angle of junction will present the necessary cutting surfaces over which the edge of the knife is to be drawn. This patent, we believe, has not yet been applied in the manufacture of the goods, but Mr. Packwood is in correspondence with some cutlery houses with reference to it, and it is intimated that before long it will be on the market.

The Plymouth Cordage Company, Plymouth, Mass., have had a disastrous fire which has done much injury to their works, but will not, however, seriously interfere with the prompt filling of orders, as they have a good stock of goods on hand and expect to start up their remaining mills next week. By that time they will make the necessary repairs on their boilers, which were injured but not destroyed. The fire started about 4 p. m. Saturday, 3d inst., in the picker room on the second floor of one of their mills, and was caused by some foreign substance getting into the picker with the hemp. As a consequence two of the mills, both four-story brick structures, one 173 x 60 feet, and the other 98 x 74 feet, with the machinery, were totally destroyed. Besides the regular hemp-working and rope-making machinery, they lost a fully-equipped machine shop, parts of machines they were building and many valuable patterns; also two stationary engines, one 250 horse-power, and the other 25 horse-power, but were fortunate enough to save their 500-horse-power engine, which is located in one of the mills which was not burned. They are already making preparations to rebuild immediately, or as soon as the season will permit, and it is intimated that they will put up model mills with the most recent improvements in machinery and greatly increased capacity.

Messrs. Bruce & Cook, New York, have issued their calendar for 1885, which in many respects is similar to the one which has been familiar to all tin-plate consumers for many years past. It has been improved, however, by an illuminated border, which makes it more attractive than previous editions. The name of the senior and lately deceased member of the firm remains at the top, having been printed there before his death. The calendar is accompanied by a circular, of which the following is a reprint:

To Our Friends and Patrons: You have been informed of the sudden death of our honored senior, Mr. John M. Bruce. It has delayed our calendar for 1885, and our an-

nual greeting, and, for the first time in the history of our firm, we send it under the shadow of a mourning for one of its members. But the tide flows on though hearts may sink, and we who remain to bear the name and do the work send you greeting. Our firm name and business will continue unchanged, and none will be missed from among its active members but the genial and honored Mr. Bruce. The year past has not been a prosperous one, although good crops, low prices and cheap money have ruled. Both producing and trading classes have been scantily rewarded for toil or capital. Yet, standing at the opening of another year, with hands full of products of the soil and the workshop, and prices ruling at a lower average than for many years past, we may hopefully look forward to an active and more profitable business. We hope to be favored with your orders as usual, and you may be assured of the same prompt and careful attention to them. With compliments of the season, respectfully yours,

BRUCE & COOK.

New York, January 5, 1885.

Pattee & Draper succeeded the old firm of R. Pattee & Co., manufacturers of the well-known Holyoke Fire Hydrant, at Holyoke, Mass. Mr. E. P. Draper is the new member of the firm.

Dame, Stoddard & Kendall, Boston, issue this year, as heretofore, a tasty calendar, which is presented with their compliments, and will be found worth keeping by their customers.

The Francis Axe Company, Buffalo, N. Y., T. P. Burke, agent, 100 Chambers street, are to be congratulated on the artistic and very attractive calendar for 1885 which they issued as a Christmas card. The only difficulty with it is that the merchants who receive it will be tempted to take it home.

Garlin & Fulton, importers and wholesale dealers in Hardware, Cutlery, Guns, Grindstones, Barbed Wire, &c., Baltimore, send out with their compliments an effective calendar for the present year. It will be appreciated by their patrons.

The calendar sent out by I. E. Swift, dealer in Iron, Steel and Nails, and Railroad, Mine and Mill Supplies, Ishpeming, Mich., is well adapted to its purpose. The large and bold figures in which the dates are printed, will make it serve well as a calendar, while the method which is followed of illustrating the monthly sheets with leading articles of his trade will be a convenient reminder to his customers.

F. H. Leavenworth & Co., Detroit, Mich., under date January 1, announce that they have embarked in the business of manufacturing specialties for the Hardware trade. F. H. Leavenworth, who is referred to as the business manager of the concern, has been for several years the Secretary of the E. T. Barnum Wire and Iron Works. They have purchased the Roller-Skate business of the Detroit Fanning Mill Mfg. Co., including patterns, patents, tools, machinery, stock on hand, good will, accounts, &c., and will continue the manufacture of the Royal Roller Skates formerly manufactured by them. The Detroit Fanning Mill Mfg. Co., in referring to this transaction, mention that they have been led to this step by the increased demand for their new mill, to the manufacture of which they will devote their whole force.

Coal.

The Anthracite Coal market is without change, there being little disposition to buy so long as the Coal-trade managers have the allotment plan under discussion. The doubtful attitude of the Pennsylvania Railroad Company is the only bar to a settlement, and the conviction is becoming more fixed that in any future arrangement the other parties interested must dispense with their co-operation. Instead, it is positively affirmed that the management of that company are opposed to any agreement that may tend either to curtail production or limit the quantity that the company may be offered to bring to market. Meanwhile the volume of trade is scarcely one-half of what it should be at this season, and prices are nominal. The market is somewhat firmer, however, in consequence of the frequent stoppage of collieries at various points. The companies are reported to be asking \$3.90 @ \$4 net for domestic sizes, while individuals sell as low as \$3.65 for Stove, \$2.85 @ \$3 for Broken, \$3 for Chestnut.

The Bituminous trade are preparing to further extend their market, and with this object rates of freight and tolls from the Cumberland and Clearfield districts will probably be much reduced compared with last year. The Pennsylvania and Baltimore and Ohio Railroads have agreed upon a division of the Soft-Coal tonnage for tidewater shipments, upon a basis of 55 per cent. for the former and of 45 per cent. for the latter. The total amount of Anthracite mined in the year ending January 3, 1885, was 30,489,637 tons, compared with 31,757,651 tons for the same period of the previous year, a decrease of 1,268,014 tons. The total amount of Bituminous sent to the Eastern markets in the year ending January 3, 1885, was 5,551,644 tons, compared with 5,086,453 tons for the corresponding period of the previous year, an increase of 465,191 tons.

The production of anthracite coal in the United States in 1884 is estimated to have amounted to 30,200,000 tons. In 1883 the production was 31,703,027 tons. The Cumberland bituminous coal district produced more coal in 1884 than in any preceding year, aggregating 2,850,000 tons, against about 2,500,000 tons in 1883.



L. COES' Genuine and Mechanics, PATENT Screw Wrenches
MANUFACTURED BY
L. COES & CO.,
Worcester, Mass.
ESTABLISHED IN 1839.



Our Genuine Wrenches are made with straight bars, full width and enlarged jaw, having ribs cast inside, which strengthen the jaw and give a full bearing on front of bar. These improvements, in combination with our new ferrule, made with double bearings, an iron tube, fitted to the shank and resting against the lower bearings, rigidly held in position by the handle and nut, effectually preventing back thrust of ferrule (see sectional view), verify our claim that we manufacture the heaviest and strongest Wrench in the market. None genuine unless stamped.

L. COES & CO.,
Worcester, Mass.
Warehouse,
97 Chambers and 81 Reade Sts.
NEW YORK.
DURRIE & McCARTY,
Sole Agents

THE BEST COMBINATION
RAZOR STROP.
"THE LAMOILLE."

On which more money can be made by the Retail Dealer than on any other Strop.

PRICE PER DOZ., - - - \$3.50.
PRICE PER GROSS, - - - 38.00.

Special Price Given on 5-Gross Lots.
ADDRESS

Lloyd & Supplee Hardware Co.
PHILADELPHIA.

THE IOWA FARMING TOOL CO.,
MAKERS FOR EXPORT TRADE



Forks, Hoes, Rakes,
Etc., Etc.
SEND FOR ILLUSTRATED CATALOGUE.
WORKS ESTABLISHED 1854.

FORT MADISON, IOWA, U. S. A.

GEO. M. SCOTT,

Bellows Manufacturer,

Johnson Street,
Cor. 29d St.,
CHICAGO, ILL.

NIMICK & BRITTAN MFG. CO.,
PITTSBURGH, PA.,

BUILDERS' FINE HARDWARE,

Embracing Door Locks, Latches, Knobs, Butts, Sash Locks, &c.
IMPROVED ROSE ESCUTCHEON KNOBS,
In GENUINE BRONZE & IMITATION BRONZE.
PADLOCKS.

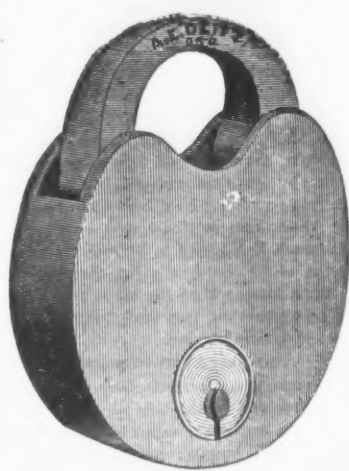
TEA, COUNTER, UNION AND PLATFORM SCALES.
Catalogues and Lists furnished on application.

JOHN H. GRAHAM & CO., Agents, 113 Chambers St., New York.



STANDARD TOOL CO., Cleveland, O. **W. A. BABCOCK,** Manager.

A. E. DEITZ.



DURRIE & McCARTY, Agents,
97 Chambers & 81 Reade Sts., New York.



CAST BRASS HARDWARE
FOR
ICE HOUSES AND REFRIGERATORS.

Manufactured and kept in stock by
W. & J. TIEBOUT,
Manufacturers of
BRASS, GALVANIZED & SHIP CHANDLERY
HARDWARE,
Nos. 16 & 18 Chambers St.,
NEW YORK.



ALWAYS GIVES THE
UTMOST SATISFACTION.

Main Belting Co.,
Manufacturers of
THE LEVIATHAN
COTTON BELTING.

Unsurpassed for
Strength, Durability and
Cheapness.
Made to any Length,
Width and Strength.
Main Driving Belts.
Guaranteed to Run
Straight, Even Through-
out.
No Cross Joints, Un-
affected by Damp.
Clings well to the Pulley.
Has no equal. In fact,
is THE BELT.

**MAIN BELTING
COMPANY,**
S. W. cor. Ninth and Reed
Sts., Philadelphia.
Also
248 East Randolph St.,
CHICAGO.

GEORGE ROSENFELD,
361 and 363 Broadway, New York,
**COMMISSION MERCHANT
FOR FOREIGN FIRMS.**

JUST PUBLISHED.
**THE ARCHITECT'S AND BUILDER'S
POCKET-BOOK**

OF
Mensuration, Geometry, Trigonometry, Rules
Tables and Formulas Relating to the Strength
and Stability of Foundations, Walls, Butt-
resses, Piers, Arches, Posts, Ties,
Beams, Girders, Trusses, Floors,
Roofs, &c. &c. Statistics and
Tables Relating to Carpen-
try, Masonry, Drainage,
Painting and Glazing,
Plumbing, &c. &c.

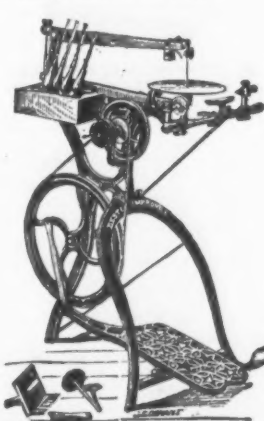
F. E. KIDDER, C. E.

Morocco, Round Corners; 600 Pages; 408 Engravings.
Price, \$3.50.

Sent, postpaid, on receipt of the price, by
DAVID WILLIAMS,
83 Reade St., New York.

ANY HARDWARE DEALER CAN HAVE A CHRISTMAS TRADE ON
SCROLL SAW GOODS
IF HE WILL GET READY FOR IT.

We now handle nearly all the Bracket Saw Blades which are used in this country, and also export large lots of them. The STAR BLADES we control, and are the New York Agents for the Griffin Bracket Blades. We also sell Wood, Designs, Clock Movements, and all things else in the line.



THE LESTER SAW and THE ROGERS SAW

have held their place against all comers, and are now the standard machines the world over. Since last year we have made FOUR great improvements on these saws—first, a new Rubber Blower, which gives as much blast as is desired; second, a new Clamp, tunnel-shaped, which guides the Saw to its place in the dark; third, a Roller inserted in the table at the back of the Saw, which makes it run as true as those which go in guides; fourth, a new Stretcher Rod, which gives the Saw a perfect adjustment.

SEND FOR CATALOGUE.

MILLERS FALLS CO.,
74 Chambers Street, - NEW YORK.



CHAMPLAIN
Forged Horse Nails.
MANUFACTURED BY THE
NATIONAL HORSE NAIL CO.,
Vergennes, Vermont.
HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST
NORWAY IRON AND WARRANTED.
WAREHOUSE
97 CHAMBERS AND 81 READE STREETS NEW YORK.
DURRIE & McCARTY, Sole Agents.

H. B. SEIDEL, President. W. HASTINGS, Vice-Pres. and Gen'l Mgr. E. T. CANBY, Sec. and Treas.
THE SEIDEL & HASTINGS CO.,
WILMINGTON, DELAWARE,
New York Office, No. 90 John St.; Entrance on Gold St.,
MANUFACTURERS OF

**BEST CHARCOAL
BOILER PLATES,**
AND PLATE IRON GENERALLY.
ALSO BEST QUALITY HOMOGENEOUS STEEL PLATES.

We ask the special attention of the trade to our C. H. No. 1 Boiler Plates, which we manufacture expressly for the Shells of Steam Boilers and stamp 50,000 pounds T. S. when desired. One hundred and sixteen tests of this iron, made during the last three years by the U. S. Inspectors of Steam Vessels, show an average tensile strength of 65,508 pounds to the sectional square inch, and an average reduction of area of the fractured section of 30% per centum. Our prices are as low as the production of a good article will admit of.



VARIETY IRON WORKS.
ALFRED C. REX & CO.,
MANUFACTURERS OF
HARDWARE SPECIALTIES, IRON TOYS & NOVELTIES.
Main Office and Factory: FRANKFORD, PHILA.
Phila. Sample Office, 415 Commerce St. New York Branch Office: 128 Chambers St.
SEND FOR CATALOGUE. Bromhall & Spier, Managers.



DAY BROS.' PORTABLE FORGES,
Fan Blowers, Tire Benders, etc.
All sizes. The most improved and handiest.
Blacksmiths' Machines of all sorts.
Send for full particulars.
419 & 421 N. 2d St., PHILADELPHIA, PA.

PURE TURKISH EMERY.
WALPOLE EMERY MILLS
South Walpole, Mass.

English Letter.

(From Our Regular Correspondent.)

LONDON, December 29, 1884.

THE OLD YEAR

is now very near its close, and the minds of business men are more occupied with the festivities of the season than with the worry of their every-day occupations. The Christmas holidays have been kept in a very thorough manner, and there have been few signs either of the current bad trade or the national decadence, of which we hear so much just now. The present week will be virtually void in a commercial sense, seeing that in the North of England, and especially in Scotland, the new year is emphatically the holiday of the entire 12 months. After that will come the period of balancing and stock-taking, and active operations will, in many instances, not be resumed until January 10 or 12. In some quarters there are rumors that the stoppage will be of even longer duration. For example, it is to day alleged that Bolckow, Vaughan & Co. have decided to close their steel works for an indefinite period, thereby throwing some 800 men out of work. In this case it is probable that the works will restart in the course of two or three weeks, but the case is typical, and, to some extent, startlingly so, of the dullness which has seized upon and overpowered a leading concern in one of our greatest industries. At other iron and steel works wages are being reduced or the engagements of the workmen entirely cancelled. Hence we have a rather cheerless outlook, and cannot be said to have good hopes for the new year. The winter is virtually only just beginning, and, if it should prove a severe one, I fear there will be much distress all over the country. Already there are many thousands of men out of employment, and it is reported that in certain places women and children are almost starving for want of food. Around the docks in London, I am told, hundreds of hungry men are daily almost fighting for employment on hard work at the remuneration of 4d. per hour, and in some of the shipping ports of the North there is no work to be had at any price. These and other similar circumstances are undoubtedly helping the

FAIR TRADERS

very materially, and are doing much to fan the flame of discontent expressed almost everywhere in respect of the existing state of things. The masses of the large manufacturing towns of the North of England are said to be fast flocking to the fair-trade standard, and the leaders of that modern fiscal departure declare that they are gaining adherents very rapidly in London and throughout the agricultural districts. They aver that the new reform bill will help them enormously, as the 2,000,000 of new voters will include the majority of the artisans who are most acutely pinched by the operation of the free-trade system. This may or may not be the case, but it is among the probabilities of our near political future, and I should not like to say that the fair traders are wholly wrong in expecting to gain much strength under the expanded franchise. In any case, I believe it is certain and inevitable that something or another must be done before long to inquire into, if not to relieve, the condition of our landowners and farmers. As a class they are almost hopelessly insolvent. It is calculated by one authority that the land owners of England alone owe £250,000,000 to mortgagees who have lent the money in more prosperous times, and are entirely and absolutely unable to repay the amount, while security (the land itself) has so shrunk in value that if realized it would not bring half the amount lent upon it. This is a very serious state of things, but I think it is understated rather than exaggerated, and I have formed that opinion on the strength of actual acquaintance with facts directly bearing upon the point at issue. Writing on the subject, one paper (*Land and Water*) says:

"At the present moment, the arable farmer is more perplexed than, probably, at any period within living memory. If he plants wheat he is certain the price will not allow of any profit. Even his straw, if allowed to be sold, is now being gradually displaced in large towns by the use of moss litter, so largely imported from Germany. Barley and oats, if less costly in the seed-bed preparation, admit of no profit. Potatoes are now selling in London at 40/- ton—a price not reached since the blight decimated the crops. Roots are seldom grown for sale except near a town, and few farmers rely on them to bring in ready money, and the sudden drop in the price of mutton has rendered the feeling of sheep on the land very problematical. The price of hay is unusually low, and the railway rates from distant stations too high to attract supplies. In Kent the greatest complaints continue to arise from the fruit growers. They have had a splendid summer, but foreign imports of fruit of all kinds have deluged the market, and prices fell to an exceedingly low level. From fruit the Kentish and Sussex men pass on to hops, and here the greatest disappointment reigns; for, with only half a crop, the market has gradually dwindled down in its quotations week after week, so that at this moment good foreign hops can be bought for 50/- cwt., and fine English at 25/- cwt. These figures show that the planter, instead of realizing a moderate profit of £10 per acre, is actually losing more than that sum on every acre in cultivation. Naturally every man in business turns to his cost side of accounts, and if he finds he can do with less labor, and at a less rate, he will do so; and this is the farmer's only loophole left. He cannot reduce his rates or his taxes. His rent may be reduced, and so the day laborer has either to seek a fresh employer or submit to a lower wage. The wisest heads and most profound thinkers are at a loss to propound a remedy for this yearly increase of agricultural losses. Some think that war on a large scale, where our food supplies would be imperiled, is the only remedy; others say that the land must and will be gradually smashed up into less estates, so that our farmers will in a few

years be reduced to a peasant proprietary, and, like the Continental agriculturists, have no more acres under cultivation than what the farmer and his family can cultivate with their own unaided labor. Then there are others, and their voices are growing louder and more numerous every day, who insist on a reversal of that wholesale robbery called "free trade," and instead thereof would collect a small revenue at our ports on all agricultural produce that enters. The time has arrived, and perhaps it may be shown before another year passes over, that a majority of the 2,000,000 of new voters admitted to the polling booths will insist that, whether it is going back or not, some check shall be placed on the competition to which British farmers and laborers are now compelled to submit. Mr. Joseph Hume once declared that England would be quite as prosperous were she not to grow a blade of corn. It is fast coming to that point as to the corn-growing, but the prosperity is evidently absent. Even our market gardeners are scared, as a Belgian official is about visiting London to make arrangements for a daily supply of vegetables. Italy already, now the Alps are pierced, sends large supplies of vegetables and eggs. All this is very nice, and a consumer purchases as much now for 18/- as he could last year for a sovereign, but, unfortunately, the laborer's £1 is reduced to 15/-.

Parliament can do nothing in a crisis like the present. Too much interference has already enervated the English farmer; he has been told to look for aid from Compensation acts, instead of giving him fair play in the world's competition."

Mr. Kennard, M. P., is engaged in a warm controversy with Mr. Bright on the subject, and hits the latter rather hard when he says: "Mr. Bright has suddenly, and on very slight provocation, rushed into Wiltshire and gored the landlords, raising the cry of 'No rents' at a time when every landlord in the county is making considerable concessions in this regard. It will be readily seen by every artisan that if the cost of pro-

duction of corn is to be reduced by the elimination of the item rent, and thereby a better fight made against the foreign competitor, and higher wages secured at the same time, the same process should be applied to the production of fabrics. 'Handsome is that handsome does,' so let Mr. Bright hand over his mill to a co-operative band of artisans, rent free, and then come into Wiltshire with clean hands and a conscience purged by fire." Dealing with the question of free trade, Mr. Kennard asks why we find our Mundellas at Chemnitz, in Germany, and our Isaac Holdens at Roubaix, in France, if England is so advantageously situated among protecting communities, as it is asserted by Mr. Bright and others that she is. "These capitalists who desert our free-trading shores are," says Mr. Kennard, "shrewd people, and know what they are about, and they subscribe large sums of money to the Cobden Club exchequer with their tongues in their cheeks, knowing that the free-trade craze must be kept going long enough to allow of their disengaging their dead capital (mills, machinery, &c.) from the confusion which would ensue upon the imposition of a duty on the goods they are supplying us from abroad at a ruinous cost to English workmen." These quotations may be taken to represent some of the growing feelings of fiscal discontent, and I repeat that I shall not be surprised to witness before long a vigorous attempt to revise our free-trade policy on the part of the malcontents.

THE IRON MARKET

is again unchanged in the open market as regard both prices and the business reported done, but there appears to be very little doubt that in several grades of crude iron next year's supplies—or, at all events, deliveries extending over the first quarter of 1885—are being negotiated for at rates which are distinctly below the published figures of the time being. To some extent this remark is also applicable to merchant qualities of finished iron and sundries. All things considered, it is not to be wondered at, probably, that producers are desirous of securing new business on the best terms obtainable, even if such terms are so bare as to afford promise of extremely lean profits. In addition to this consideration, it has to be borne in mind that materials of all kinds, fuel and wages, are not only very cheap, but are unlikely to advance in value, so far as can be ascertained at the present time. As a whole, indeed, the existing situation seems to convey the impression that almost all values are down to the lowest possible level, so that in respect of prime costs all manufacturers are pretty much on



THE "OHIO" WELL DRILLING MACHINE. MANUFACTURED BY LOOMIS & NYMAN, TIFFIN, OHIO.

Some alarm is felt to-day on the announcement that a French concern has taken a Roumanian order at lower than the association prices.

SCOTCH PIG IRON

is very quiet with a holiday market. Warrants are 42/6 and makers' brands:

Deliverable alongside.	No. 1.	No. 2.
Gartsherrie, at Glasgow.....	52/6	47/9
Coltness.....	56/6	51/9
Langloan.....	57/6	52/6
Summerlee.....	58/6	47/3
Caldar.....	55/6	48/6
Carnbroe.....	49/6	47/6
Clyde.....	47/6	44/6
Monkland.....	43/6	41/3
Quarrier.....	42/6	40/9
Govan, at Broomielaw.....	43/6	41/6
Shotts, at Leith.....	58/6	52/6
Carron, at Grangemouth.....	49/6	48/6

The annual statistics are not yet issued, but the following is a brief comparative statement:

Shipments from Xmas in blast at date.	Furnaces to date.	Price of date.	Stock in Glasgow store at date.
1884.....	529,114	38	573,633
1883.....	628,657	103	583,678
1882.....	630,196	112	608,629
1881.....	562,529	105	627,195
1880.....	621,048	123	496,452
1879.....	555,518	100	418,127

MIDDLESBORO' PIG IRON

is weak and nominal at the appended figures:

No. 1 Foundry.....	Mottled.....	No. 2.
" 2 ".....	White.....	33/3
" 3 ".....	Refined Metal.....	32/6
" 4 ".....	Kentledge.....	38/6
" 4 Forge.....	Cinder.....	32/6

WEST COAST HEMATITES

stand at 44/- @ 44/6 for mixed lots, with makers' brands:

Cleator.....	No. 1.	No. 2.	No. 3.
Lonsdale.....	46/6	45/6	45/6
Workington.....	45/6	44/6	44/6

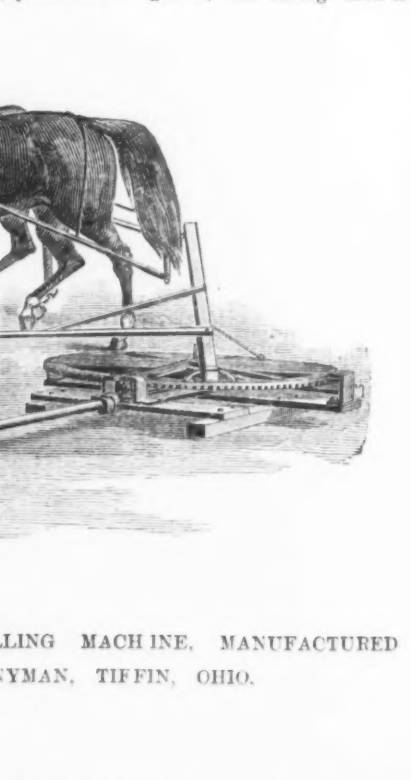
TIN PLATES.

West Cumberland.....	No. 1.	No. 2.	No. 3.
Londrina.....	45/6	44/6	44/6
Distington.....	45/6	44/6	44/6
Harrington.....	46/6	45/6	44/6
Solway.....	45/6	44/6	44/6
Maryport.....	45/6	44/6	44/6

In London, since my last report, there has been a little more inquiry in the market, but it has not been of any account. The year is drawing to a close with a quiet feeling all round. Quotations have undergone no alteration during the week, and IC cokes may be given as 14/- @ 14/6, and charcoals, 15/6 @ 15/6; steel plates with coke tinning, 15/6, and coke wasters, which are in fair demand, at 13/-, all free on board, Liverpool. At Liverpool this week is usually a dull one, but this year it is unusually so. There was little or nothing done there after Wednesday, Christmas day and boxing day being close holidays, and then there never is much doing on Saturday at any time. So far there has been but little inquiry for coke tins, and the market opened flat on Monday. There was but little else going on but talk of lower prices still to come, and 14/- IC is now only to be obtained for very good brands, with 14/3 @ 14/6 IC for some of the leading brands. Anything short of good B. V. grade does not fetch 14/- IC, and it is this fact which is the cause of sales being reported at 1 1/2d. and 3d. less. It is difficult to trace and get these reports authenticated, sellers not being over anxious to admit of such rates, and they certainly are not worth boasting of. Coke-tin wasters are still in fair demand at 13/3 @ 13/6, some mixed parcels of both sizes have been sold at the former figure, and some of the smaller sizes alone at even less. There are a few good inquiries for Bessemer and Siemens steel plates with coke finish, but the orders are not for large quantities of either sort, those for Bessemer being the heaviest. Prices of these are still unchanged at 14/3 @ 14/6, FC, and Siemens or best steel at 15/6 @ 15/6, IC, according to specification. The inquiries for charcoal and best charcoal tins are on the increase, several good inquiries having come in again this week, but so far prices are stationary, and they certainly cannot be moved upward. The demand for ternes is a limited one, and the market may be said to be very quiet, with no prospect of a change for a month or two. There seems a prospect of better trade next year, and if this turns out to be correct, no doubt tin plates will share in the improvement. But an improvement in price could soon be brought about if fewer plates were made, and the current holidays will have a good effect in that respect.

The "Ohio" Well Drilling Machine.

The "Ohio" well drilling machine, manufactured by Loomis & Nyman, of Tiffin, Ohio, is a machine for drilling wells and for prospecting in any kind of earth or rock. It is said to work where the diamond drill fails, and when prospecting for coal to allow of the easy determination of the thickness of the seam. The work of this machine is all done by drilling with a lift and drop motion to the tools. The drill is a compound chisel bit, reamer and sand pump, and is connected to a hollow drill stock which reaches to the top of the well, and which is arranged so that the cuttings of the drill are discharged with considerable force from the end of the rubber hose, which is connected to the top of the drill stock by a swivel joint. The tools are lifted by being grasped by the concave jaws, which are carried up and down rapidly by the cross-head and guide. When the jaws reach the proper height they are released, and the tools drop freely without detention from being connected to a rope, and with no back-lash or jar to the machine, and with no jerk on the horse. From 70 to 90 drops of the drill per minute is mentioned as the usual speed. One horse can be used for drilling all wells from 250 to 300 feet deep, the set of tools weighing from 800 to 1000 pounds, while for greater depths, where two horses are used, a set of tools, it is said, can be used which weigh more than the combined weight of the machine, horse-power and derrick. In using this drill, so long as the earth does not cave, the manufacturers state that the hole can be sunk very fast and the pipe or tubing need not be put in, nor need the tools be taken out of the well until it is finished, unless accident occurs, or it becomes necessary to insert the tubing. It is further stated that in using this machine the bottom of the hole is always clean and the drill will not stick fast if left set for some time. Where drilling through soft material, as quicksand or gravel, the tubing used is



settled by driving at the same time that the drill works and the cuttings are pumped out. For sinking through rock expansion drills are made which cut a hole large enough for the tubing to follow while the drill itself can pass through the tube. The same can be applied to earth drilling if desired, and in all this work the cuttings of the drill are carried out and deposited at the surface, as shown in the accompanying cut. Among other advantages, such as increased speed and economy of power, which are claimed for this machine, is its testing the water supply without necessitating the removal of the tools from the well. This is done by simply allowing the water to run back into the hole, when the adequacy of the supply is soon determined.

Zinc Works in Spain.—The only zinc works in Spain, says an exchange, belong to the Société Royale Asturienne. They are located at Arnao, near Aviles, in Asturias, in a small coal-basin, separated from the central coal-basin. These works treat ores coming from the Provinces of Santander and Guipuzcoa, with 22 Belgian furnaces, blende roasting furnaces, and a sheet-zinc rolling plant. In 1881 the production was 4910 metric tons of zinc from 13,000 tons of ore, while in the preceding year it was only 4221 tons. The production of sheet zinc was 2125 tons. In 1881 the export of spelter amounted to 1743 metric tons, of which 1515 tons went to France and 228 tons to Cuba. It appears, therefore, that the consumption of Spain is 1042 tons of spelter and 2125 tons of sheet zinc—a total of 3167 tons. In 1881 the export of zinc ore was 39,774 tons, of which 31,227 tons were calamine and 8547 tons were blende. Adding to these figures the 13,000 treated at Arnao, a total of 53,834 tons is reached, or over 10,000 tons more than the production returned by official statistics.

Representatives of the Spanish Government have recently been in England inspecting the various establishments where heavy ordnance is manufactured. At Sheffield they have placed an order for the plant necessary to produce gun forgings of the largest kind. In Spain there are already in course of construction large steel and iron works, which will have the advantage of being near to the famous hematite ores of the Bilbao Mountains. A Sheffield company is arranging with a local engineering establishment for a supply of plant capable of producing the heaviest ordnance. The plant, it is stated, will cost at least \$1,000,000.

WHOLESALE METAL PRICES, January 14, 1885.

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢ per lb.; provided that no Bar Iron shall pay a less rate of duty than 35¢. Sheet, 11-0¢ to 15-10¢ per lb. Band, Hoop and Scroll, 1¢ to 1-4-10¢ per lb. Railroad Bars weighing more than 25 lb. per yard, 7-10¢ to 1¢ per lb.

Standard American Pig Iron.
Foundry No. 1 X..... per ton \$18.00 @ 19.00
Foundry No. 2 X..... per ton 17.00 @ 18.00
Gray Forge..... per ton 16.00 @ 17.00

No. 1 Scotch Pig Iron.
Carnegie..... per ton 19.50 @ 20.50
Coltess..... per ton 21.50 @ 22.50
Shotts..... per ton 21.50 @ 22.50
Glenbrook..... per ton 21.50 @ 22.50
Gartshore..... per ton 21.50 @ 22.50
Langlois..... per ton 21.50 @ 22.50
Summerlee..... per ton 21.50 @ 22.50
Dalzellington..... per ton 21.50 @ 22.50
Eglington..... per ton 21.50 @ 22.50
Clyde..... per ton 21.50 @ 22.50

Rails.
Steel, at Eastern mills..... per ton 28.00 @ 29.00
Old Rails, Ts..... per ton 16.50 @ 17.00

Scrap.
Wrought, per ton, from yard..... 17.50 @ 18.00

Bar Iron from Store.

Common Iron:
¾ to 1 in. round and square..... per lb. 1.7 @ 2.0
1 to 6 in. x ¾ to 1 in. per lb. 1.9 @ 2.2

Refined Iron:
¾ to 2 in. round and square..... per lb. 2.1 @ 2.4
1 to 6 in. x ¾ to 1 in. per lb. 2.1 @ 2.4
Rods—¾ and 1-16 round and sq. per lb. 2.3 @ 2.5
Bands—1 to 6-16 to No. 12..... per lb. 2.3 @ 2.5
"Burden's Best" Iron, base price..... per lb. 2.6
Burden's "H. B. & S." Iron, base price..... per lb. 2.6
Norway Nail Rods..... per lb. 2.6

Sheet Iron from Store.

Nos. 10 to 16..... per lb. 2.70 @ 3.00
17 to 24..... per lb. 3.00 @ 3.30
25 to 36..... per lb. 3.30 @ 3.60
37 to 48..... per lb. 3.60 @ 3.90
49 to 60..... per lb. 3.90 @ 4.20

Galvanized, 10 to 30..... per lb. 3.00 @ 3.30
Galvanized, 31 to 36..... per lb. 3.30 @ 3.60
Galvanized, 37 to 48..... per lb. 3.60 @ 3.90
Galvanized, 49 to 60..... per lb. 3.90 @ 4.20
American Russia..... per lb. 4.00 @ 4.30
Sussia..... per lb. 4.00 @ 4.30
American Cold Rolled B. B..... per lb. 4.00 @ 4.30

Iron Wire. See Wire.

STEEL.—Duty: Ingots, Bars, Sheets, &c., valued at 4¢ per lb. or less, 45¢ ad. val.; valued above 4¢ and not above 7¢ per lb., 25¢ ad. val.; valued above 7¢ and not above 10¢ per lb., 25¢ ad. val.; valued above 10¢ per lb., 25¢ ad. val. Extra-Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 15¢ per lb. in addition to above; Steel Circular Saw Plates, 1¢ per lb. in addition to the above.

American Cast Steel.

For American Steel, see Pittsburgh quotations.

English Steel.

Best Cast..... per lb. 1.15 @ 1.25
Extra Cast..... per lb. 1.15 @ 1.25
Circular Saw Plates..... per lb. 1.15 @ 1.25
Round Machinery Cast..... per lb. 1.15 @ 1.25
Swaged Cast..... per lb. 1.15 @ 1.25
Best Double Shear..... per lb. 1.15 @ 1.25
Blister, 1st quality..... per lb. 1.15 @ 1.25
German Steel, Best..... per lb. 1.15 @ 1.25
2d quality..... per lb. 1.15 @ 1.25
3d quality..... per lb. 1.15 @ 1.25

Sheet Cast Steel, 1st quality...... per lb. 1.15 @ 1.25

2d quality...... per lb. 1.15 @ 1.25

3d quality...... per lb. 1.15 @ 1.25

TIN.—Duty: Plates, Sheets, Taggers and Termes, 1¢ per lb.; Bars, Block and Pig free.

Banca..... per lb. 1.15 @ 1.25

Straita..... per lb. 1.15 @ 1.25

English..... per lb. 1.15 @ 1.25

Bar..... per lb. 1.15 @ 1.25

Charcoal Tin Plates.

1 C 10x14..... 225 sheets..... per box \$5.25 @ \$6.00

1 C 12x12..... 225 sheets..... per box 11.00 @ 12.50

1 C 20x28..... 110 sheets..... per box 6.50 @ 7.75

1 X 10x14..... 225 sheets..... per box 6.50 @ 7.75

1 X 12x12..... 225 sheets..... per box 6.50 @ 7.75

1 X 14x20..... 112 sheets..... per box 5.00 @ 5.50

1 X 12x17..... 100 sheets..... per box 6.25 @ 7.00

each additional X add..... per box 1.50

Coke Tin Plates.

Best..... per lb. 4.75 @ 4.87 ½

Ordinary..... per lb. 5.12 ½ @ 5.00

1 C 10x14..... 225 sheets..... per box 5.00 @ 5.50

1 C 12x12..... 225 sheets..... per box 5.00 @ 5.50

1 C 20x28..... 112 sheets..... per box 10.50

Terne Plates.

Prime Char. 2d. quality..... per lb. 4.75 @ 4.87 ½

1 C 14x20 M. P. 7 ½ @ 7.25

1 C 14x20 Troughing, Old Troughing..... per lb. 6.75

1 C 20x28..... 110 sheets..... per box 14.00

1 C 14x20..... 225 sheets..... per box 4.50

1 X 14x20..... 112 sheets..... per box 6.00 @ 6.12 ½

1 X 12x12..... 225 sheets..... per box 9.50 @ 9.87 ½

1 X 20x28..... 110 sheets..... per box 12.50 @ 13.00

1 C 20x28..... 110 sheets..... per box 13.50 @ 14.00

Tin Boiler Plates.

1 X 14x20, 2 sheets for No. 7, 112 sheets..... @ \$13.50

1 X 14x20, 2 sheets for No. 8..... @ 14.50

1 X 14x20, 2 sheets for No. 9..... @ 16.00

COPPER.—Duty: Pig, Bar and Ingot, 4¢; Old Copper, 3¢; Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad. valorem.

Ingot, Lake..... per lb. 11 ½ @ 11 ¾

Ingot, Baltimore..... per lb. 11 ½ @ 11 ¾

Ingot, Anchor..... per lb. 11 ½ @ 11 ¾

Brassiers' Copper, ordinary sizes..... per lb. 18 ½

Brassiers' Copper, ordinary sizes, under 16 oz. and over 12 oz. ½..... per lb. 18 ½

Brassiers' Copper, 10 oz. and 12 oz. ½..... per lb. 22 ½

Lighter than 10 oz. ½..... per lb. 25 ½

Circles less than 8 in. in diam..... per lb. 23 ½

8 in. in diam. and over..... per lb. 24 ½

Segment and Pattern Sheets..... per lb. 22 ½

Locomotive Fire-Box Sheets..... per lb. 30 ½

Sneathing Copper, over 12 oz. ½..... per lb. 16 ½

Bolt Copper..... per lb. 18 ½

Copper Bottoms..... per lb. 18 ½

Nickel-Plated Sheathing..... per lb. 35 ½

Plating extra..... for boilers..... per lb. 37 ½

Flat Copper Boiler Bottoms or Fit Bottoms, cut to special sizes..... per lb. 21 ½

Tinning.

14x18, by the case..... per sheet, 8¢

4x18, less than case..... per sheet, 8¢

For tinning both sides, double the above amount.

O'Neill's Patent Planished Copper, Net..... 14x18

12 and 16 oz. and heavier 35¢ By the case, ½ lb. 25¢

12 oz. and lighter..... 35¢

7 in., 14x22, 8 in., 14x20, 9 in., 14x20, 14 and 16 oz. and heavier 32¢ By the case, ½ lb. 31¢

(And all sizes not over 30 in. wide.)

24x48 and 30x60..... 24x48 and 30x60

14 and 16 oz. and heavier..... ½ lb. 34¢

12 oz..... ½ lb. 37¢

Copper Wire.—(See Wire.)

Sheathing Metal.

ellow Sheathing Metal, ½ lb..... 30 @ 30

BRASS AND GERMAN SILVER.

Brown & Sharpe's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

Brass Manufacturers' Price List, January 17 1884..... per lb. 80 @ 80 ½

LEAD.—Duty: Pig, 2¢ per 100 lb.; Old Lead, 2¢ per 100 lb.; Pipe and Sheet, 2¢ per 100 lb.

American..... 4 @ 4.12 ½

Har..... 4 @ 4.12 ½

Pipe..... 4 @ 4.12 ½

Block Tin Pipe..... 15¢ dis 20 ½

Tin Lined Pipe..... 15¢ dis 20 ½

Sheet..... 6¢ dis 20 ½

Shot..... Drop, 6¢; Buck, 7¢

Chilled Shot..... Drop, 6¢; Buck, 7¢

ANTIMONY.

Hallett's..... per lb. 10 ½ @ 11 ½

Cookson..... per lb. 10 ½ @ 11 ½

SPELTER.—Duty: Pigs, Bars and Plates, \$1.50 per 100 lbs.

American, cash..... 4 ½ @ 5 ½

Bergerport..... 4 ½ @ 5 ½

ZINC.—Duty: Pig or Block, \$1.50 per 100 lbs.

Sheet, 24¢ per lb.

600 lb. casks..... 5 @ 5 ½

Zinc—Open..... 5 ½ @ 6 ½

Zinc Tubing—Dis. 25 ½

Plain..... 27

Fancy..... 28

Scotch and Extra Patterns..... 36

HARBITT METAL.

N. P. U. U..... per lb. 7 @ 7.50 ½

A. 2¢; B. 2¢; C. 1 ½¢

WIRE.

Iron Wire.—Put up in 63 lb. bundles.

Nos. 00 to 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.

10..... 11 ½ @ 12 ½

Bright Market Wire..... dis 70 ½

Charcoal..... dis 50 ½

Bale Wire, Nos. 7 to 12..... dis 70 ½

Annexed Market Wire..... dis 70 ½

Fence Wire, Nos. 8 and 9..... dis 70 ½

Grape Wire, Nos. 10 to 14..... dis 70 ½

Bessemer Steel Wire..... dis 70 ½

Coppered Market Wire..... dis 65 ½

Bale Wire, Nos. 7 to 12..... dis 65 ½

Galvanized Market Wire..... dis 60 ½

Fence Wire..... dis 60 ½

Stone or Weaving Wire.

Nos. 16 to 18..... 22 ½ @ 23 ½

Cents..... 14 15 16 17 18 19 20 21 22 23 24 25 26

Nos. 27 28 29 30 31 32 33 34 35 36

Cents..... 27 28 29 30 31 32 33 34 35 36

Nos. 16 to 18..... dis 70 ½

19 to 26..... dis 70 ½

27 to 36..... dis 75 ½

Galvanized Stone Wire..... dis 55 ½

Steel Wire.

Cast Steel, Steel Wire List..... dis 55 ½

Brass and Copper Wire.

Old English Gauge the Standard—Dis 20 @ 30

Common High Low

Brass Copper

All Nos. to No. 16..... \$0.22 @ \$0.35

Inclusive..... \$0.22 @ \$0.35

No. 17 and 18..... \$0.22 @ \$0.35

" 19 and 20..... \$0.22 @ \$0.35

" 21..... \$0.22 @ \$0.35

" 22..... \$0.22 @ \$0.35

" 23..... \$0.22 @ \$0.35

" 24..... \$0.22 @ \$0.35

" 25..... \$0.22 @ \$0.35

" 26..... \$0.22 @ \$0.35

" 27..... \$0.22 @ \$0.35

" 28..... \$0.22 @ \$0.35

" 29..... \$0.22 @ \$0.35

" 30..... \$0.22 @ \$0.35

" 31..... \$0.22 @ \$0.35

" 32..... \$0.22 @ \$0.35

" 33..... \$0.22 @ \$0.35

" 34..... \$0.22 @ \$0.35

" 35..... \$0.22 @ \$0.35

" 36..... \$0.22 @ \$0.35

" 37..... \$0.22 @ \$0.35

" 38..... \$0.22 @ \$0.35

" 39..... \$0.22 @ \$0.35

" 40..... \$0.22 @ \$0.35

" 41..... \$0.22 @ \$0.35

" 42..... \$0.22 @ \$0.35

" 43..... \$0.22 @ \$0.35

" 44..... \$0.22 @ \$0.35

" 45..... \$0.22 @ \$0.35

" 46..... \$0.22 @ \$0.35

" 47..... \$0.22 @ \$0.35

" 48..... \$0.22 @ \$0.35

" 49..... \$0.22 @ \$0.35

" 50..... \$0.22 @ \$0.35

Commons, per 100 lb..... 40 @ 50

Binders' Board Cuttings..... 40 @ 50

Straw Board Cuttings, per cwt..... 40 @ 50

PAINTS, OILS, &c.

Paints.

Black Lamp—Coach Painters..... per lb. 23 @ 24 ½

" Ordinary..... per lb. 23 @ 24 ½

Ivory Drop, fair..... per lb. 12 @ 13 ½

Black Paint, in oil, kegs, 8¢; assorted cans, 11¢

Blue, Prussian, fair to best..... per lb. 40 @ 55 ½

" Chinese dry..... per lb. 18 @ 20 ½

Brown, Spanish..... per lb. 18 @ 20 ½

Van Dyke..... per lb. 10 @ 12 ½

Green Chrome..... per lb. 14 @ 16 ½

" Paris..... good, 20¢; best, 25¢

" In oil..... good, 30¢; best, 35¢

Iron Paint, Bright Red..... per lb. 13 ½ @ 15 ½

Brown..... per lb. 13 ½ @ 15 ½

Purple..... per lb. 13 ½ @ 15 ½

Ground in oil, Bright Red..... per lb. 13 ½ @ 15 ½

" Red..... per lb. 13 ½ @ 15 ½

" Brown..... per lb. 13 ½ @ 15 ½

HARDWARE NOVELTIES.

Ice Pick and Tongs.

The illustration which we give herewith represents a nice tool made by the Acme Shear Company, Bridgeport, Conn. It is, as will be perceived, a combination of an ice pick and tongs, and as such is designed for use not only in the household, but also in hotels, restaurants, &c. By reference to the illustration it will be seen that one arm forming a part of the tongs is securely joined by a strong hinge, to the main body of the tool. A brass spring is inserted between the arms of the tongs in order to open the same, so that the ice can be taken up with facility after it has been broken by the ice pick, which constitutes the other end. The steel points acting as wedges are described as breaking the ice with exceptional facility, and nearly as evenly as if cut with a saw. The trade will appreciate the convenience of having these two tools combined in one. It is galvanized. Information as to its price to the trade is given in our Trade Report.

The Victor Scroll-Saw.

The Seneca Falls Manufacturing Company are introducing a new Scroll-Saw called the "Victor," which is adapted for either foot or steam power. A general view of the machine, arranged for foot-power, is afforded by Fig. 1 of the engravings. This machine

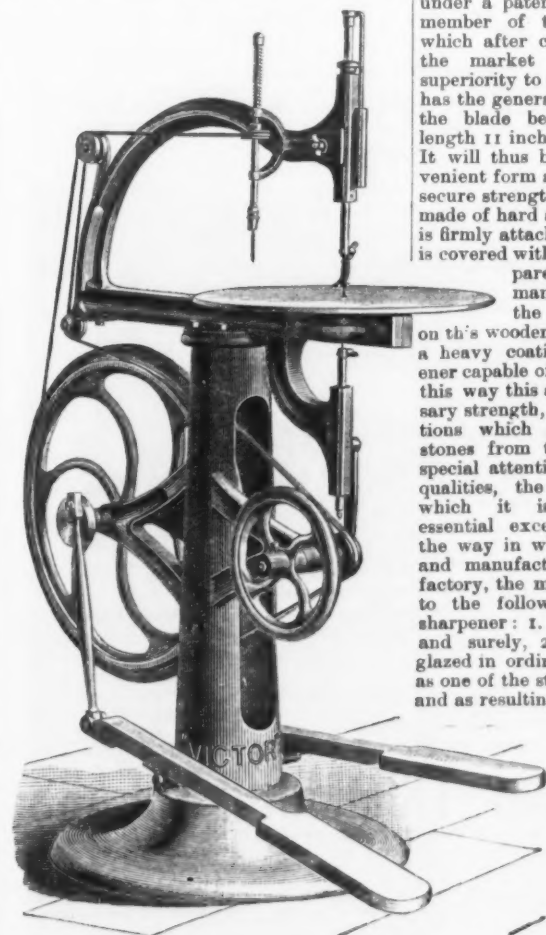
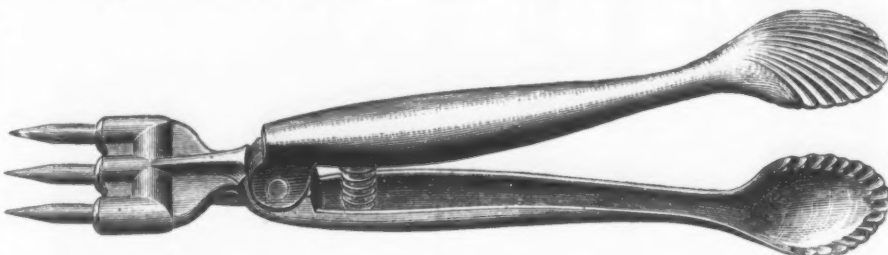


Fig. 1.—The "Victor" Scroll-Saw Arranged for Foot-Power.

has greater capacity than many other scroll-saws in the market with which it might be compared, which takes it out of the realm of amateur machinery and adapts it to use in planing mills, carpenter shops and wood-working establishments generally. It is so constructed as to be suitable for either light or heavy work, and the makers offer it as a tool cutting with the greatest precision from the lightest and most delicate material that might be put into it up to stuff 3 inches thick. It has a swing of 24 inches. The machine is provided with an adjustable tension in connection with the upper spindle, that may be varied to suit the operator. Regular 8-inch saw blades can be used in this machine, and yet it can be adjusted so as to use 5-inch blades for fine work, if desired. The table is of iron, made to tilt. It is 18 inches in diameter, and can be changed to any angle for sawing inlaid work. The table and all other finished parts of the machine are nickel-plated, a fact which gives it a fine appearance. An adjustable upright drilling attachment is provided, which is clearly shown in the engraving. A dust blower is also provided, which works satisfactorily, and keeps the

Fig. 2 we show what is called the "Victor" Lathe, an attachment that is furnished by the company with the saw above described. When in use this lathe takes the place of the saw table. The length of bed is 26 inches, the distance between centers 15 inches and the swing 6 inches. The head is a hollow-steel



Ice Pick and Tongs.

spindle, nicely fitted with face-plate, spur center, cap center, &c. On the outside is fitted a 4-inch solid emery-wheel for dressing and polishing tools, metals, &c. The tail-stock has a steel screw spindle with hand-wheel. With this lathe there is furnished a set of cast-steel turning tools with 6-inch blades and hardwood handles. The average speed of the lathe is about 4000 revolutions per minute.

Sperry's Knife Sharpener.

Slate & Sperry, Hartford, Conn., are the manufacturers of this article, which is made under a patent of A. W. Sperry, the junior member of the house. This Sharpener, which after careful experiments is put on the market with confidence as to its superiority to other devices for the purpose, has the general form represented in the cut, the blade being 7 inches long, the total length 11 inches and the weight 4½ ounces. It will thus be seen that it is made of convenient form and size for use. In order to secure strength, the interior of the blade is made of hard and strong wood, by which it is firmly attached to the handle. This blade is covered with a thick coating of emery prepared in a manner which the manufacturers do not explain, the emery being apparently cast on this wooden blade in a mold. This gives a heavy coating, and renders the sharpener capable of much work. Constructed in this way this article certainly has the necessary strength, and entirely avoids the objections which are made to manufactured stones from their liability to break. But special attention is called to its sharpening qualities, the emery, in the manner in which it is prepared, securing this essential excellence. After referring to the way in which the steel commonly used and manufactured stones fail to be satisfactory, the manufacturers direct attention to the following points of merit in this sharpener: 1. That it does its work quickly and surely; 2. That it does not become glazed in ordinary use, which they refer to as one of the strong points of the invention, and as resulting from the use of certain ingredients in its manufacture; 3. That it is very strong, tough and durable, and cannot be broken by any ordinary means, the blade being claimed to be nearly as strong as cast iron of the same size, which makes it practically indestructible; 4. That the surface of the sharpener does not perceptibly wear away by contact with the knife, if it is treated with oil occasionally, as per the directions which accompany each sharpener, so that it will last for years; 5. That with the use of this sharpener no grinding of the knife is necessary; and 6. That its low price brings it within the reach of all. This sharpener is made with a variety of handles in color, to match the ordinary knives and forks in general use. But on this point more definite information may be gained from



Sperry's Knife Sharpener.

the Trade Report, where the descriptive list and prices are given.

Slate & Sperry will soon be prepared to supply all kinds of sharpening devices, including substitute for oil-stones, special stones for mowing machines, and a wheel for farmers' general use, to take the place of grindstones, razor hones, and numerous other articles, which are not yet ready for



Fig. 2.—"Victor" Lathe, an Attachment for the Scroll-Saw Shown Above.

lines of the work free from sawdust. The driving-wheel is made heavy, and is 24 inches in diameter. When used as a foot-power machine it is provided with a double foot-treadle, with a walking motion, a device by which much greater power can be obtained with less fatigue than in the ordinary form. The average rate of speed while sawing is about 100 strokes per minute. The height from floor to top of table is 40 inches, which enables the operator to run the machine with both feet when he is sitting, or to stand at the machine and operate it with one foot. When furnished for steam-power, tight and loose pulleys arranged to connect with the driving-wheel shaft are provided on either side, leaving the treadle connected on the opposite side. In

the market, all of which will be made under patents of A. W. Sperry, some of which are already issued and others pending.

A Philadelphia Technical School.—The establishment of a department of chemistry in the Pennsylvania School of Art, at 1336 Spring Garden street, Philadelphia, is a subject of great interest to all concerned in the development of technical education in the United States. The plan of Mr. Theodore C. Search, chairman of the Committee on Instruction, and a large manufacturer, is to have a separate building, in which will be a laboratory and all the apparatus necessary to experiment in dyeing materials. The pupils will be taught to

form and apply all the different kinds of dyeing materials. A prominent manufacturer who has been in Europe studying the industry states that it is an actual necessity that some such step be taken in this country in order to keep pace with the rapid advances in the general knowledge and skill of Euro-

pean workmen, due entirely to the schools of industrial art. Mr. Search hopes by the opening session next fall to have the school of chemistry in operation and power looms at work. The pupil will then be taught how to clean and wash the raw material, how to form his dyes and apply them, and how to design and weave. He believes that the future of the textile industry of the country depends upon a more general system of education. It was at first intended by himself and 25 other manufacturers to establish an independent school, and \$30,000 was subscribed for the purpose. The Philadelphia papers say that a part of this now will no doubt be voted to meet any wants that may arise in the establishment of the department.

INDUSTRIAL ITEMS.

MASSACHUSETTS.

Rogers & Sheldon, proprietors of the East Bridgewater Nail Company, announced a reduction of the wages of employees of their rolling mill on the last day of the year. As a result none of the rolling-mill hands went to work last Thursday, and the establishment came to a standstill.—*Boston Journal of Commerce.*

RHODE ISLAND.

The last day of 1884 the Pawtucket Mfg. Co. shipped 8 tons of small bolts. About the same time they sent their twelfth cold-punch nut machine to the Upson Nut Company, of Cleveland, and they are now engaged on the thirteenth for the same firm. Beside their regular business of bolt-making, which is good, they are now rebuilding three engines, and have facilities for doing a miscellaneous line of machine work. All their machinery, most of which is very ingenious, is of their own make.

CONNECTICUT.

The following shipments of feed-water heaters have been made recently by the National Pipe Bending Company, of New Haven: One 100 horse-power to Canfield Rubber Company, Bridgeport; one 100 horse-power to J. B. Savage, Southington; one 60 horse-power to Fairbanks & Co., Albany, N. Y.; one 60 horse-power to Shatto & Dennis, Minneapolis, Minn.; one 50-horse-power to Goes, Drummond & Co., Amesbury, Mass.; and one 50 horse-power to Pettes Machine Works, Newton, Mass. The company are now building a 500 horse-power heater for an electric light station in Massachusetts.

NEW YORK.

At Rochester, on December 31, articles of incorporation of the Woodbury Engine Company, as successors to Woodbury, Booth & Pryor, engine and boiler manufacturers, were filed in the county clerk's office. The trustees and directors for the first year were named as follows: D. A. Woodbury, J. E. Booth, Henry H. Pryor, W. A. Montgomery and W. J. Creelman. The capital stock by these articles is fixed at \$115,000, divided into 1150 shares of \$100 each. The life of the charter is named at 50 years and the officers of the new company are: Henry H. Pryor, president; J. E. Booth, vice-president; W. A. Montgomery, secretary and W. J. Creelman, mechanical engineer. Al-

though the name of the firm and the form of its organization are new, there is in reality but little change. D. A. Woodbury established the original engine and boiler business in 1851 and a year or two later admitted his father, Jonathan Woodbury, to partnership and also his brother, Edmund F. Woodbury, now a member of the firm of Strong, Woodbury & Co., whip manufacturers. The style of the firm was D. A. Woodbury & Co., and that name was continued up to 1865 when it became Woodbury Booth & Co. Ten years later it was changed to Woodbury, Booth & Pryor.

NEW JERSEY.

For some time past the Standard Oil Company have been engaged in building six gigantic tanks at their station in Garfield, across the river from Passaic. The riveters, of whom there are about 50, up to the 9th inst. received \$2.50 per 1300 rivets, which was considered a day's work. On that day the contractors notified the men that the pay would be reduced to \$2.50 for 1500 rivets. The men at once went on strike.

PENNSYLVANIA.

Powelson Furnace, at Saxton, Bedford County, owned by R. H. Powell's Sons & Co., has been in continuous blast since October, 1882, during which period there has been produced and shipped to market over 50,000 tons of metal. The proprietors own an area of almost 14,000 acres of ore land, adjacent to the furnace and connected therewith by a narrow-gauge railroad, containing a large supply of fossil hematite ores and limestone. There is also connected with the plant 1700 acres of coal land, the coal from which is coked in bee-hive and Belgian ovens for fuel at the furnace. The proprietors also own and control some 5000 acres of the cele-

brated Juniata Valley hematite ore, and their extensive ore washers at Dry Hollow are capable of washing and jigging at least 350 to 400 tons per day. It is contemplated at an early day to erect another stack, as the present one is inadequate to supply the demand which they experience for their iron.

One of a set of 10 boilers which supply steam to the Kehley Run Colliery, at Shandooah, exploded on January 6, doing great damage in the boiler-house and vicinity. A week will be required to put things in order sufficiently to again start the colliery. The cause of the explosion is not known.

The Merion Iron Company are running one of their furnaces at West Conshohocken.

The Blandon Rolling Mill of the Maiden-creek Iron Company, of Reading, at Blandon, which shut down December 20 for lack of orders, is still idle. The town is feeling the effects of the suspension severely.

The iron roof of the new casting-house, at Robesonia Furnace is up, and masons will soon commence laying the foundation for the new furnace.

Douglas Furnace No. 1, at Sharpsville, owned by Pierce, Kelly & Co., which was blown out recently, had been in steady operation five years, lacking six weeks, with the exception of two months in 1880, when it was banked. During this period (the actual running time being about four years, eight months) 105,000 gross tons of iron were made. This is at the rate of 22,500 tons per annum. The furnace is 60 feet high, with 16-foot boshes. Pierce, Kelly & Co. are placing an improved form of Uehling's gas seal on their No. 2 Furnace.

The Pennsylvania Steel Company report that during the month ended December 24 their Bessemer works produced 13,231 tons of ingots; their rail mill, 8722 tons of steel rails; their blooming mill, 12,660 tons of blooms, and four of their blast furnaces, 11,768 tons of pig metal. Their No. 5 furnace was put in blast January 1 for the first time since her purchase by the company, and is doing well. This stack was formerly called Dock Furnace.

The nail machines are being put in position at the new works of the Ellis & Lessig Steel and Iron Company, Limited, at Pottstown. The works will probably be ready to commence operations in a month or two.

Neshannock Furnace of the Crawford Iron and Steel Company, Newcastle, will probably be blown in this week.

PITTSBURGH AND VICINITY.

The statement is widely published that Carnegie Bros. & Co. are going to fire up their large blast furnaces at the Edgar Thomson Steel Works plant, to make mill pig iron for the Western Pennsylvania market, having at their works a large stock of mill cinder, estimated at 45,000 tons, which they propose to work up in this way. This would be a very important occurrence if true, as it would have a very serious effect on the price of mill pig iron at Pittsburgh, but it is denied by members of the firm, who say there is no foundation whatever for the report. When the Edgar Thomson furnaces are again put in blast it will be on Bessemer pig iron for their own consumption as usual.

A reduction in the wages of all workmen not working on the scale was announced last week by Oliver Brothers & Phillips, but it is understood that it has since been practically withdrawn.

Quite a feat in the manufacture of steel castings has been accomplished by the Pittsburgh Steel Casting Company. The Consolidated Ice Machine Company, of Chicago, had contracts for machines to be delivered by the 10th of January, 1885, requiring for the same between 14,000 and 15,000 pieces of complicated castings. Their manager, Mr. Becker, was sent on with patterns, with instructions to sleep in the works if necessary to get out the castings on time. Accordingly, 18 molders were started on the work, with instructions to work as many hours as they were able, and the castings were got out in the period of 25 days.

A new train of 12-inch jobbing rolls has just been made in this city for the St. John Iron and Nail Company, at St. John, N. F. Within the last eight months this company have had several trains of nail rolls, an engine and other rolling-mill machinery made in this city. The main product of these works is small nails for the supply of the codfish trade in that country. Heretofore the company have bought their rolled nail plates from England, but about a year ago they built four scrap furnaces, in which they began to manufacture their own muck iron. This is the first iron mill in that part of the world requiring the work of puddlers.

The National Tube Works, of McKeesport, started up full on Monday. The company have completed connections with the Murrysburg gas district and will hereafter use that fuel exclusively in their works.

The Budke Mfg. Co., at Canonsburg, are busier now than they have been since they first started, and more men have been recently employed. The specialty of the works is powder canisters.

OHIO.

The Steubenville Bottle Works were sold at assignee's sale on January 3, to Joshua Manley, the price paid being \$6150, two-thirds of the appraised value.

The rolling mill of the Cherry Valley Iron Company, at Leetonia, has started up full, all employees whose wages are not governed by the scale working at a reduction of 10 per cent., dating from January 1.

The mills of Brown, Bonnell & Co., Youngstown, which have been idle for some time, will soon be in full operation. Muck mills Nos. 1 and 2 and the sheet mill were started on January 5, and the other departments have since started up or will soon resume.

It is reported that the Ohio Iron Company, Zanesville, will soon start up their mill. The Bellaire Nail Works have announced a reduction of their steel-workers' wages to the basis recently established at Homestead, Pa. The works have been idle, taking stock, but

will resume this week. There will probably be no trouble in regard to the reduction.

The Trumbull Iron Company, of Girard, have resumed work at their mill in all departments.

The Belfont Iron Works Company, of Ironton, have their drilling machinery in place, and have commenced boring for gas. A well 2000 feet deep is contracted for.

The Mansfield Machine Works have announced a general reduction of 10 per cent. on all hands in their employ, to take effect on January 12. These works usually run about 175 hands, but for some time past only about half that number have been employed.

The New York and Ohio Iron and Steel Company, of Ironton, are at present running their mill on old steel rails, which they are re-rolling by a new process.

INDIANA.

It is stated that the Indianapolis Rolling Mill Company contemplate converting their property from a rail to a merchant-bar mill. The company in 1881 added to their old iron-rail plant a mill for rolling steel rails, but have never yet operated it, and probably will take the above step in view of the present low price of steel rails.

MICHIGAN.

The officers of the Eureka Iron and Steel Works, Detroit, and the Amalgamated Association officials recently held a consultation relative to starting the works at a reduction in wages. The result is not yet made known.

During the past year Pioneer Furnaces made 13,149 tons of pig iron. Deer Lake Furnace made 10,753 tons (of 2268 pounds), and Vulcan Furnace made 11,080 tons.

ILLINOIS.

The C. W. Kimball Mfg. Co., of Chicago, which made an assignment some days ago, will probably resume business in the near future. The assets are, it is thought, more than enough to cover liabilities. The assignment was made to protect creditors.

The Ogden Engine Company, of Chicago, are placing in position in their machinery department a new boring mill. The company are now busy on a number of engines of 20 to 60 horse-power for electric-lighting purposes, and are also making some changes in their automatic cut-off engine. Still further additions of machinery are to be made to their plant, and the company expect to be in the market with their engines by February 1.

The North Chicago Rolling Mill Company are putting new rolls in their North Chicago plant for the manufacture of structural irons, channels, beams, &c.

The Excelsior Iron Works, of Chicago, are shipping a smelting plant to Butte, Montana, and report a large number of inquiries for mining machinery.

The American Steam Boiler and Machine Works, of Chicago, are putting in additional machinery.

MISSOURI.

On the 6th inst. Charles Miller was appointed receiver of the Harrison Wire Works, of St. Louis, on the petition of a number of bondholders and creditors, but on the 7th inst. the judge who had appointed him announced that the matter would be held in abeyance until it could be investigated, as there was a prior application for a receiver pending before another judge.

The Helmbacher Forge and Rolling Mills Company, of St. Louis, have started up their puddling furnaces, the prime object being, it is stated, to give employment to their employees in that department.

The St. Louis Stamping Company will start their rolling mill in a week or 10 days.

The St. Louis Chain Works have resumed work, after a holiday shut down of two weeks, and report that orders are coming in freely.

VIRGINIA.

We learn from the *Virginian* that F. J. Chapman is filling an order from Victoria furnace for 1000 tons of ore from the beds along the southern slope of Purgatory Mountain, near Buchanan, Botetourt County. The Rorer Iron Company, through their superintendent, J. H. Bramwell, have recently sold from their Gale mine, south of Roanoke, 5000 tons of iron ore to the Lynchburg Iron Company, for use in their furnace at Lynchburg, and 5000 tons to the Crozer Iron and Steel Company, for use in their furnace at Roanoke.

WEST VIRGINIA.

The reduction in the wages of the coopers of Wheeling and vicinity, which promised to cause trouble among the nail mills in that section, has been accepted by the men, and all of the shops are again in operation. The reduction was necessitated by a fall in the price of kegs, and will probably be rescinded when the market justifies such action.

Press telegrams state that in addition to the reduction of wages at the Riverside Iron Works, Wheeling, to the Homestead basis, of which notice was recently given, half the force of men employed have been notified that their services are no longer required by the company, and the works will be run single turn.

MARYLAND.

The McCullough Iron Company's Works, at Northeast, which have been shut down about two weeks, will start up again this week at a reduction of from 10 to 12 per cent. Employment will be given to about 300 men. The same company's rolling-mills, at Rowlandsville, which were nearly destroyed by the floods of last June, have been rebuilt, and resumed manufacturing sheet iron January 5.

The board of directors of the Hagerstown Steam Engine Company re-elected their old officers on the 8th inst. and decided to resume operations with 70 employees, leaving about one-half of the former force off. They will resume on Monday, January 19. A reduction of 10 per cent. will be made in the wages of all employees receiving over \$1 a day.

Meeting of the Board of Managers of the American Iron and Steel Association.

At a meeting of the board of managers of the American Iron and Steel Association, held at the office of the association in Philadelphia, on Tuesday, January 6, 1885, the following members were present: John W. Chalfant and Wm. Metcalf, of Pittsburgh; Charles L. Bailey, of Harrisburg, Pa.; Paris Haldeman, of Chickies, Pa.; Alfred Hunt and John Fritz, of Bethlehem; Samuel M. Felton, E. Y. Townsend, Andrew Wheeler, Joseph Wharton and David Reeves, of Philadelphia, and Frederick J. Slade, of Trenton.

Mr. Chalfant was elected chairman and Mr. Swank acted as secretary. Letters were presented from J. B. Moorhead, W. E. C. Cox, Charles H. Ashburner, S. P. Bowen, J. J. Spearman, William Means, R. E. Blankenship and Col. H. S. Chamberlain, members of the board, regretting their inability to be present. A large number of letters from other members of the association were also presented. Nearly every letter received recommended in strong terms the election of Mr. B. F. Jones as the new president of the association, and not one letter suggested any other name for the position.

The resignation of Mr. Morrell as president of the association was presented and accepted.

On motion of Mr. Wheeler the following tribute to the retiring president was unanimously adopted:

"The Board of Managers of the American Iron and Steel Association, in accepting the resignation of their president, the Honorable Daniel J. Morrell, cheerfully bear testimony to his active and intelligent interest in all the work of the association since its organization more than 20 years ago, and especially in that part of its work which has related to the policy of protecting all American industries from injurious foreign competition. An example of his services to the cause of protection that will long be remembered is recorded in the history of the Philadelphia Centennial Exhibition, which demonstrated to the world the great progress of our country as a manufacturing nation under a protective policy, and which magnificent display was in large part a triumph of his patriotic zeal and executive ability. Nor will his frequent and timely and always pointed contributions to the literature of protection soon be forgotten. We tender to him in his retirement from our councils our sincere regret that declining health makes that retirement necessary, and we earnestly hope that in the enjoyment of the rest and repose he has so well earned his life may be yet prolonged many days."

On motion of Mr. Slade, Mr. B. F. Jones, of Pittsburgh, was unanimously elected president of the association. Mr. Jones is the head of the well-known firm of Jones & Laughlins, iron manufacturers.

Mr. Metcalf moved that the office of vice-president and general manager of the association be created. This motion was unanimously adopted, when Mr. Metcalf moved that Mr. James M. Swank, the present secretary of the association, be chosen to fill the new position. This motion was also unanimously adopted.

Mr. Townsend moved that Mr. George W. Cope be elected secretary of the association, which motion was unanimously adopted. Mr. Cope was for 10 years, from 1873 to 1883, the assistant secretary of the association.

The following changes in the executive committee were then made: Mr. Percival Roberts, in place of Hon. Daniel J. Morrell; Mr. David Reeves, in place of Mr. A. B. Stone; and Mr. Frederick J. Slade, in place of Hon. Abram S. Hewitt. Mr. Hewitt still remains a vice-president of the association.

The Executive Committee will now be constituted as follows: B. F. Jones, chairman; William Metcalf, J. B. Moorhead, Frederick J. Slade, Joseph Wharton, Samuel M. Felton, E. Y. Townsend, David Reeves, Andrew Wheeler, W. E. C. Cox, Paris Haldeman, Percival Roberts.

On motion of Mr. Metcalf, it was resolved that a quorum of the Executive Committee shall hereafter consist of four members and the president, or five members if the president be absent.

The financial statement of Mr. Andrew Wheeler, treasurer of the association, was presented and read, showing amount in treasurer's hands December 31, 1884, \$4,193.99.

The following declaration concerning the best methods of promoting the foreign commerce of the country was adopted unanimously:

"The Board of Managers of the American Iron and Steel Association avails itself of the opportunity to express its hearty sympathy with all proper efforts that may be made by our Government to increase the sales of our surplus products in foreign markets. It does not, however, regard as a safe method of extending our foreign commerce the adoption of a policy of negotiating commercial treaties, as that policy would imperil the domestic control of our home markets, which must always continue to be our best markets. It is respectfully suggested that the surest and the safest way to secure the extension of our foreign commerce is to afford adequate encouragement to American capital to establish lines of steamships between our own and foreign ports, which steamships would carry the American mail and afford all needed facilities for an interchange of American products for the products of foreign countries, without endangering the existence of any worthy and necessary American industry."

On motion of Mr. Fritz, Mr. Jones, the president of the association, Mr. Metcalf, one of the vice-presidents, and Mr. William J. Lewis were appointed a special committee to adopt such measures as may be necessary to promote the manufacture of tinplate in our country, such action as it may recommend to be approved by the executive committee of the association.

There being no further business to transact, the board adjourned to meet at the call of the president.

A press telegram from Syracuse, N. Y., says that on the 13th inst. one of the tanks of the Selway Process Soda Ash Works, in

Geddes, exploded, blowing the entire roof from the south wing of the main building. The exploded tank was thrown from the wreck through a breach in the brick wall 20 feet wide. There were in the wrecked portion of the building, at the time of the accident, eight men, of whom seven were injured. One man was severely scalded. The tank which caused the explosion was used in extracting ammonia from the refuse sediment from the other reservoirs. In this tank a high pressure was maintained, from which the accident resulted. The man who is known as the distiller is said to be responsible for the explosion. The damage to the building and property is about \$75,000. The explosion will probably cause the closing of the entire works for the present, throwing 250 men out of employment.

CONTENTS.

	PAGE.
Improved Hot-Blast Oven for the Shelby Iron Company, Alabama. Illustrated	1
Machine for Mixing Molding Sand	1
Separating Tin from Tin Plate	1
An Improved Calcining Furnace	1
Plant and Processes	1
New Inventions	5
Continuous Automatic Brakes. Illustrated	7
New Publications:	
History of the Manufacture of Iron in All Ages, and Particularly in the United States for 300 Years, from 1585 to 1885	9
The Passenger Pool and a Clearing House	9
Report of the United States Commission of Fish and Fisheries for 1883	9
Trade Publications:	
Copper and Brass	11
The Alabama Coal Fields	11
Hand-Tools for Iron and Wood Working	11
Wrought-Iron Ornaments	11
Lubricating Oils	11
Boilers	11
Wood Split Pulleys	11
The Baldwin Locomotive Works' Exhibit at New Orleans	11
Bolt and Nut Machinery	11
The Past Year's Shipbuilding on the Clyde	11
Work at Terre Noire	11
The New York Chamber of Commerce on Tariff Matters	18
New Iron-Ore Fields in Canada	18
The Bleeding Valves. Illustrated	18
The Reagan Transportation Bill	15
Analyses of Virginia Iron Ores	15
Editorial:	
The American Steel Trade	16
The Situation in Iron	16
Wages in England and the United States	16
Special Overland Contracts Abolished	16
Mexican Indebtedness	16
Mr. Randall and Protection	17
Washington News	17
Obituary:	
John B. Jervis	17
Resuming Work at the North Chicago Rolling Mill	17
The Hartup Engine Suit	17
Heavy Verdict Against an Iron Company	17
Serious Blunder in the New Tariff	17
The Iron Age Directory	19
Trade Report:	
British Iron and Metal Markets	21
Financial	21
New York Iron Market	21
Metal Market	21
Metal Exchange	21
Philadelphia	22
Pittsburgh	22
Chicago	22
Chattanooga	23
Cincinnati	23
Baltimore	23
Louisville	23
Imports and Exports	23
Foreign Markets	23
General Hardware	24
Coal	25
English Letter	27
The "Ohio" Well-Drilling Machine. Illustrated	27
Zinc Works in Spain	27
New York Wholesale Hardware Prices	28
New York Wholesale Metal Prices	30
Hardware Novelties:	
Ice Pick and Tongs. Illustrated	31
The Victor Scroll-Saw. Illustrated	31
Sperry's Knife Sharpener. Illustrated	31
A Philadelphia Technical School	31
Industrial Items	31
Meeting of the Board of Managers of the American Iron and Steel Association	32
Philadelphia and Pittsburgh Hardware and Metal Prices	43
Boston Hardware and Metal Prices	44

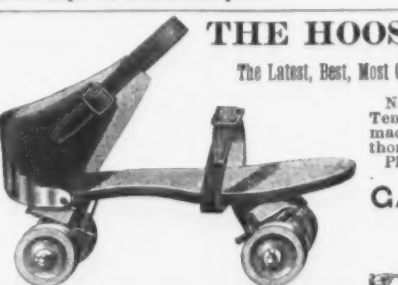
A WONDER ON WHEELS.



More merit with less complication: more work with less annoyance; will plow harder ground with less draft than any plow on or off wheels. No pole required (except in stumpy fields). Side draft and neck weight impossible. Has no equal on side hills. Holds a straight furrow without drifting. The strongest, simplest and best-made Plow in market. Address:

ECONOMIST PLOW CO.,
South Bend, Ind.

P. S.—The dealer selling the "Solid Comfort" need not spend his profit "doctoring" it. It is easier adjusted than a hand plow.



KITSELMAN'S Champion Roller Skate

PATENTED JUNE 12, 1883; CANADA, MAY 28, 1884.
IMPROVED AUGUST, 1884.

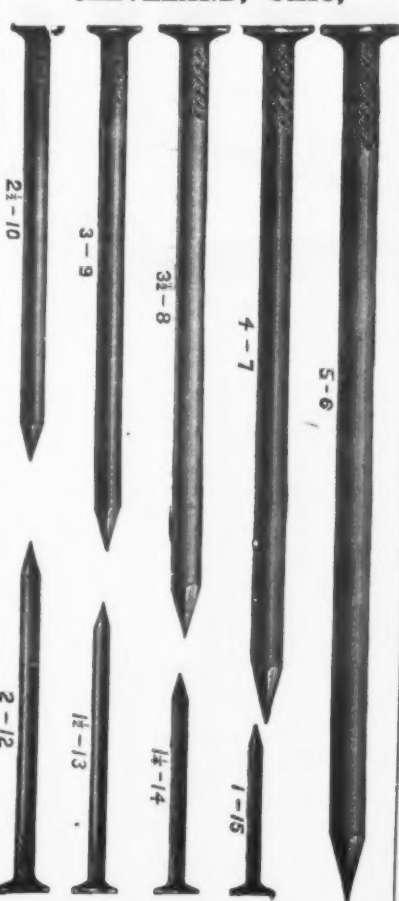
The Latest, Lightest, Most Complete and Best Practical Mink Skate made. It has Six New and Very Useful Improvements. Will turn shorter than any skate made. The Foot Boards are Elasticized, making a very fine finish. Liberal Terms to the Trade.

For Catalogue, Price List, &c., address

KITSELMAN BROS., Ridgeville, Ind.

THE IP NAIL CO.,

CLEVELAND, OHIO,



WIRE NAILS

OF ALL KINDS.

Barbed or Plain Steel, Iron and Brass Nails, Cast Steel Wire Brads, Cast Steel Wire Finishing Nails, Cigar Box Nails, Escutcheon Pins, Wagon Nails, Clinch Nails, Hinge Nails, Wire Spikes for Track, Bridge and Dock Work, Tinned Nails, Galvanized Nails.

Fine German Silver DRAWING INSTRUMENTS.

- No. 72.—Dividers, German Silver, 3 inches long, with Pen, Pencil and Needle Points, \$2.50
- No. 73.—Dividers, German Silver, 6 inches long, with Pen, Pencil and Needle Points and Lengthening Bar, \$3.00
- No. 78.—Spacing Dividers, all steel, with Spring and Adjusting Screw, \$1.25
- No. 81.—Bow Pen, all steel, with Spring and Adjusting Screw, \$1.50
- No. 84.—Bow Pencil, all steel, with Spring and Adjusting Screw, \$1.50
- No. 89.—Drawing Pen, 4 to 6 inches long, German Silver, fine finish, Hinge to Pen and Contracting Pin, \$0.75

These instruments are of fine quality, and are recommended to Architects, Carpenters and Machinists for accurate drafting. The prices quoted do NOT include Express Charges.

Sent, postpaid, on receipt of price, by
DAVID WILLIAMS,
Publisher and Bookeller,
83 Reade Street, New York.

THE CLEVELAND Storage Company

Are prepared to receive **FIG. BAR AND SHEET IRON, LUMBER AND ORE,** Blooms, Ingots, Muck-Bar, Car Wheels, Rails, Machinery, Nails, &c. We also arrange to store **Fig Iron** at Furnaces, **Lumber** at Mills or in Yards, **Ore** on Docks or at Mines. Warrants will be issued on all stock received, made transferable by indorsement and deliverable to the holder on demand. These warrants will furnish a convenient medium of transfer and delivery, and serve as collateral to parties wishing advances on their stock. Correspondence solicited.

W. R. DRAKE, Sec. Room 35.
Merchants' Bank Building. Cleveland, Ohio

THE HOOSIER ROLLER SKATE.

The Latest, Best, Most Complete and Practical Skate ever offered to the Trade.

No getting out of place of the Elastic Tension Tension can be modified quicker than on any Skate made. Made of the best material, and every pair thoroughly tested. Not liable to constant repair. Please send for prices and terms to

GAAR, CLAWSON & CO.,
MANUFACTURERS,
RICHMOND, INDIANA.

Liberal Terms to the Trade.

Kitseleman's Champion Roller Skate

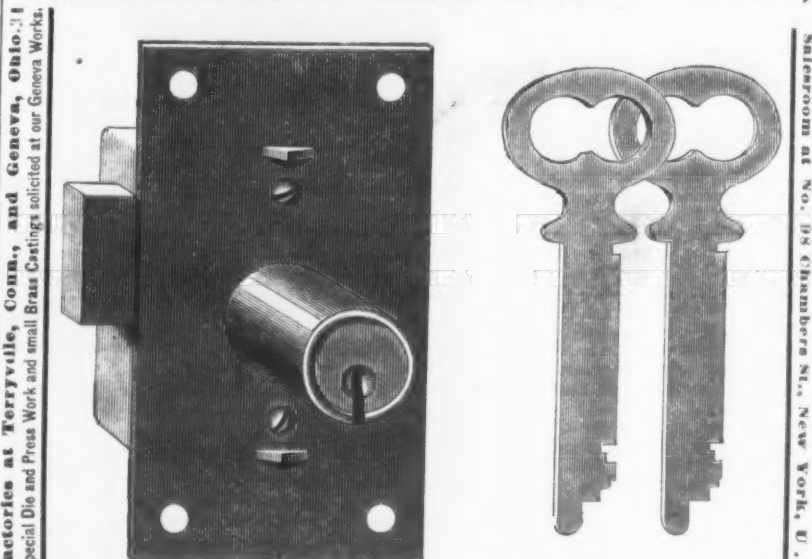
PATENTED JUNE 12, 1883; CANADA, MAY 28, 1884.
IMPROVED AUGUST, 1884.

The Latest, Lightest, Most Complete and Best Practical Mink Skate made. It has Six New and Very Useful Improvements. Will turn shorter than any skate made. The Foot Boards are Elasticized, making a very fine finish. Liberal Terms to the Trade.

For Catalogue, Price List, &c., address

KITSELMAN BROS., Ridgeville, Ind.

EAGLE LOCK CO.,

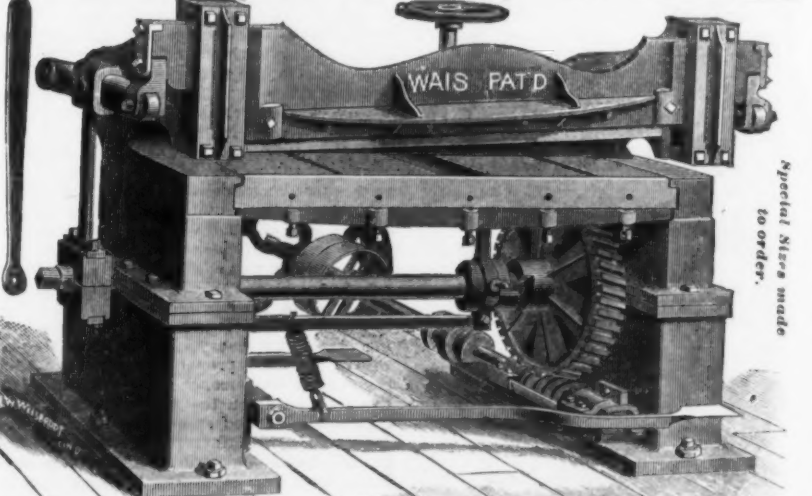


Manufacturers of the Largest Variety of
Cabinet, Trunk and Pad Locks

MADE BY ANY ONE CONCERN IN THE WORLD.

Illustrated Catalogue Mailed to the Trade Free Upon Application.

BERTSCH & CO., Cambridge City, INDIANA.



Wals Pat. Power, Foot and Lever Combined SQUARING and TRIMMING SHEARS.

This is the most powerful SHEAR ever placed before the Public. We ask an investigation of its merits. They are built in all sizes, and where it is required to trim very large sheets an extra device is furnished, operating with perfect accuracy. They also have an extra lever attachment, for adjusting the blades or cutting through a required distance of the sheet. The arms and links are so connected to the gate that, as the blade descends, the radial motion of the arms brings the blades still closer together instead of being forced apart, as in ordinary shears. The weight of the machine is 3000 lbs., and will cut 24 feet per minute of any thickness up to No. 6 or 3-16 inch iron. A strip may be cut up to 12 inches wide and of any length. A sheet can be squared up to 36 inches.

Send for Illustrated Circular.



THE RICHMOND "Star" Lawn Mower,

MANUFACTURED BY
DILLE & McGUIRE MFG. CO.,
RICHMOND, IND., U. S. A.

SEND FOR ILLUSTRATED PAMPHLET AND PRICES. Liberal Terms to the Trade.

CHICAGO SPRING BUTT CO.,

MANUFACTURERS OF
Chicago Single-Acting, Garden City Single-Acting,
Chicago Double-Acting, Garden City Double-Acting,
Chicago Blank, Garden City Screen Door, and
Keene Saloon Door Spring Butts,
JAPANNED, PLATED, BRONZE OR BRASS.

Entire New Principle and of Great Power.

Write for Catalogue and Prices.

CHICAGO SPRING BUTT CO.,

167 CLARK STREET, CHICAGO.

BRAINARD & CO., Eastern Managers, 125 Chambers St., New York.

REID'S LIGHTNING

SPECIALY DESIGNED FOR
NICKEL PLATED, WITH 2 BITS
ROSEWOOD TRIMMING - 275 POST PAID, A. H. REID,
1635 BARKER ST. PHILA.

Agents Wanted.

POST'S Waterproof Belt Oil and Leather Preservative,

FOR WET AND DRY LEATHER
BELTING.



Registered in the U. S. and Great
Britain.

The Standard Belt
Oil of the
World.

Leather dressed with this oil will not crack or rot, as heat, cold, water or gas has no effect on it. It will spread one-third further and last much longer than any oil for the same purpose. It never turns rancid; will keep in any climate. Belts may be run in water at one end and a hot room at the other, and still be soft, dry and pliable. Warranted not to start glue-laps or gum on belts or pulleys, and to keep the surface perfectly smooth.

Beware of Imitations Sold at a
Cheaper Price, the Color of which
is well Calculated to Deceive.

In their Treatise on Machine Belting,
J. B. HOYT & CO. speak of Post's
Oil as follows:

OILING OF BELTS.

"Care should be taken that belts are kept soft and pliable. For this purpose we decidedly advise the use of **POST'S WATERPROOF BELT OIL AND LEATHER PRESERVATIVE.**" When applied as DIRECTED, it makes the Belt smooth, pliable and adhesive, and causes it to hug the pulley closely, so that no power is lost from lack of pulley contact. It possesses excellent preservative qualities and also renders the leather more impervious to dampness than any article or preparation we know of.

Moisture should not be allowed to penetrate the laps or joints, as it will dissolve the cement and cause the laps to come apart."

ESTABLISHED AGENCIES.

UNITED STATES:

J. B. Hoyt & Co., New York.
J. & H. Phillips, Pittsburgh, Pa.
J. B. Farnum, Woonsocket, R. I.
G. D. Barr, Buffalo, N. Y.
Preston & Nott, Minneapolis, Minn.
Post & Co., Cincinnati, Ohio.
J. B. Hoyt & Co., Chicago, Ill.
Langlois & Son, Racine, Wis.
Laurence & Herkner, New York.
Barnum Bros., Troy, N. Y.
Brown Bros. & Co., Providence, R. I.
Jas. H. Billington & Co., Philadelphia, Pa.
Beck & Gregg Hardware Co., Atlanta, Ga.
Covel & Osborn, Fall River, Mass.
J. Ashton & Son, Trenton, N. J.
Geo. A. Smith, Richmond, Va.
W. H. Dillingham & Co., Louisville, Ky.
E. B. Preston & Co., Chicago, Ill.
Cameron & Barkley, Charleston, S. C.
Townner, Landstreet & Co., Baltimore, Md.
C. E. James, Chattanooga, Tenn.
C. B. Choate, East Saginaw, Mich.
E. G. Studley & Co., Grand Rapids, Mich.
Mantle & Cowan, Louisville, Ky.
E. F. Bradford & Co., Cincinnati, Ohio.
The J. LeRoy Pine Co., Troy, N. Y.
H. D. Edwards & Co., Detroit, Mich.
Morley Bros., East Saginaw, Mich.
J. H. & N. A. Williams, Utica, N. Y.

CANADA:

Robin & Sadler, Montreal.
NEW BRUNSWICK:

R. Chestnut & Sons, Fredericton.

SCOTLAND:

Robert Balderston, Glasgow.

ENGLAND:

O. & W. Ormerod, Rochdale.

If you cannot get POST'S OIL
from your Belt Maker, send direct
to us and we will see that you do
get it.

PRICE, PER GALLON, \$1.50.

10 gallons, \$15.00....boxing and can, \$1.00.
25 " 37.50....no charge for 1/2 Bbls.
50 " 75.00.... " " Barrels.

We solicit Correspondence from
Dealers in Manufacturers' Sup-
plies.

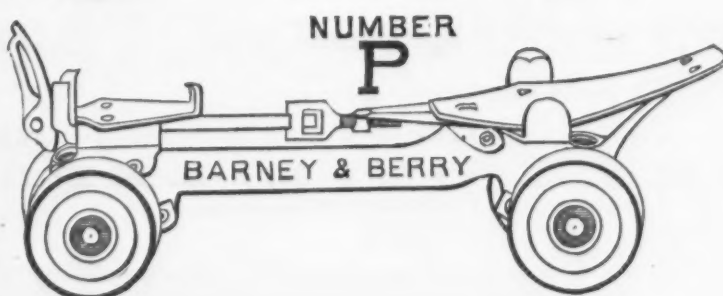
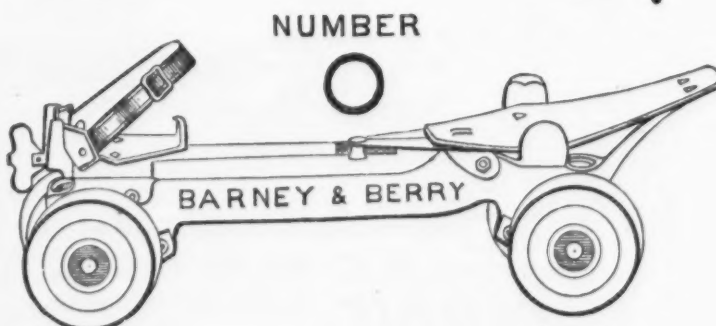
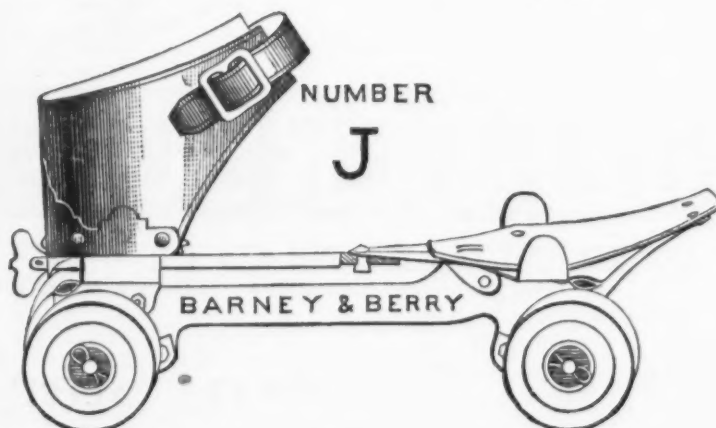
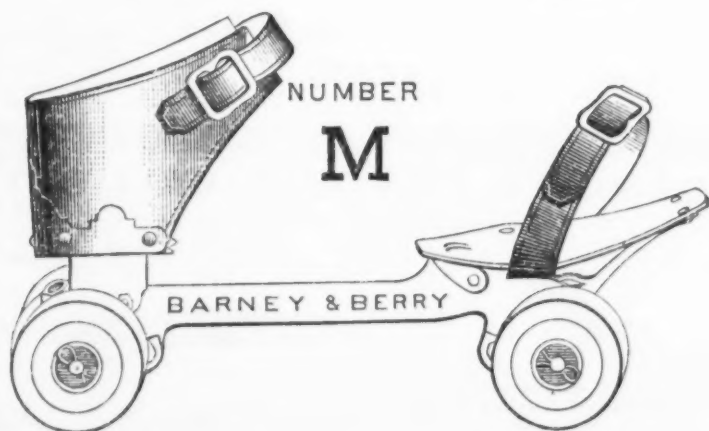
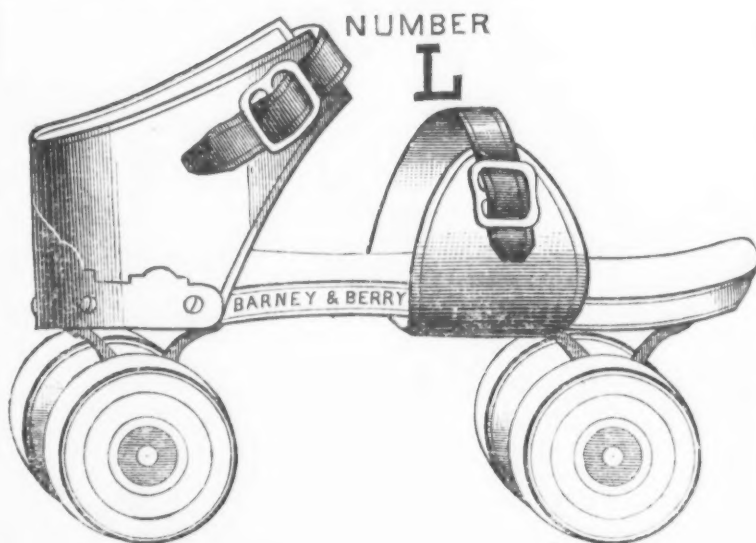
E. L. POST & CO.,

No. 10 Peck Slip, New York,

SOLE MANUFACTURERS.

BARNEY & BERRY'S NEW LINE OF ROLLER SKATES

FOR THE
Season of 1884:



NEW YORK OFFICE, - - 114 Chambers St.

BOSTON OFFICE, - - 125 & 127 Pearl St.

PHILADELPHIA OFFICE, 514 Commerce St.

FACTORY,
SPRINGFIELD, MASS.

Catalogue of Roller and Ice Skates mailed free on appli-
cation.

HENLEY'S CHALLENGE ROLLER SKATE.

THE LATEST AND BEST AND MOST
COMPLETE SCIENTIFIC

SKATE

IN THE MARKET.

PATENTED
October 16, 1880,
AND
August 28, 1881.



LIBERAL TERMS TO THE TRADE.

For Prices, Circulars and further particulars, address, mentioning *The Iron Age*,
M. C. HENLEY, Patentee and Manufacturer.
REMOVED TO NEW FACTORY, 1220 TO 1224 NORTH 8 ST., RICHMOND, IND.

THE SCRANTON MFG. CO.,

MANUFACTURERS OF

ANTI-FRICTION STEEL HANGERS,

For all Kinds of Sliding Doors.



The simplest, most perfect, strongest and cheapest Hangers
for barns, houses, railroads, warehouses, freight and passenger
elevators, &c., &c. Hangers for large and heavy
doors a specialty. Also makers of Lock Joint, Round
Edge Track, the Scranton Latch, Automatic Gate Hinges, &c.
Illustrated catalogue sent on application.

SCRANTON MFG. CO.,

15 Washington St., CHICAGO, ILL.

MANUFACTURERS' AGENTS:

BRAINERD & CO.,
125 Chambers St., N. Y.
H. BENJAMIN,
213 W. 3d St., Cincinnati.

SANDERSON & GUIGNON,
919 Olive St., St. Louis.
M. D. NICKLES,
Fremont, Neb.

DOG COLLARS AND FURNISHINGS,

MEDICINES AND BISCUIT.

Nothing Can Equal
Them.



Send for our 1885 Catalogue
for New Styles and
Prices.

MEDFORD FANCY GOODS CO.

101 CHAMBERS ST., NEW YORK.

J. BREMER, General Manager.



Spring
Dividers
with
Patent
Washer.

J. STEVENS & CO.,

P. O. Box 224, Chicopee Falls, Mass.,

Manufacturers of

SPRING CALIPERS, DIVIDERS,

FINE MACHINIST TOOLS

and FIRE ARMS. Our

SHOOTING GALLERY RIFLE

is the favorite everywhere.

SEND FOR ILLUSTRATED CATALOGUE AND DISCOUNTS.

[No. 9.]

UNION STONE COMPANY,

Patentees and Manufacturers of the

UNION EMERY WHEEL AND MACHINERY,

WOODEN POLISHING WHEELS.

Specialties:

EMERY,
QUARTZ,
CORUNDUM.



UNION STONE CO.
BOSTON

The Diamond Tool, for Dressing or Truing Emery Wheels.

Grinders' and
Polishers' Supplies.

Catalogue
on Application.

38 & 40 HAWLEY ST., BOSTON, MASS.

J. HAISH & CO.,

SOLE MANUFACTURERS OF

THE RATTLER.

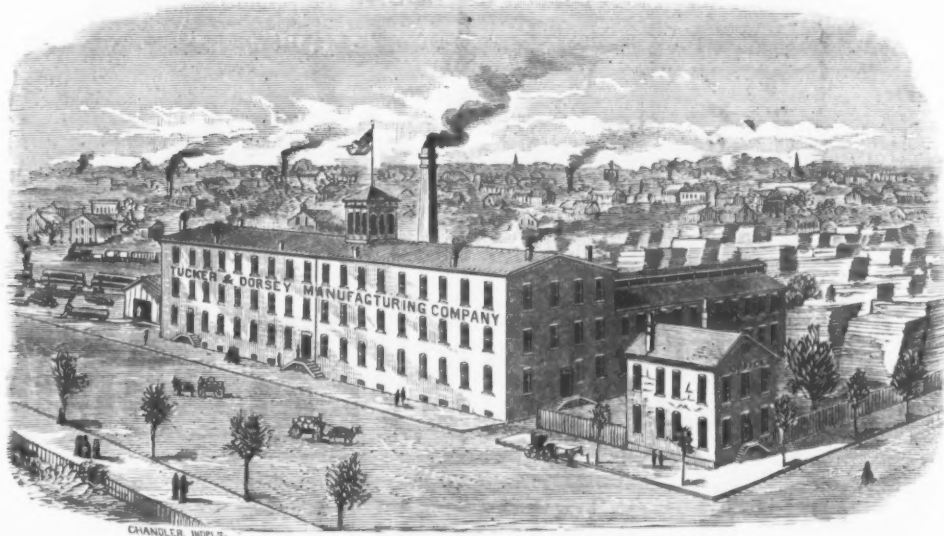


Haish's 8 Barb Steel Fence Wire, the Pioneer and Duplex Galvanized and Enamelled; barbs locked
on both wires, and possesses more excellent quality than any fence ever produced. We also call your
attention to the Jacob Haish Wire Fence Stretcher, Double Crank, Double Rope, Center Draft, and
offered to the public as the best device in the world for stretching wire fences. Every stretcher guaranteed
to do perfect work or no sale. Send for sample and price list. Liberal discount to jobbers.

HOME OFFICE, DE KALB, ILL.

TUCKER & DORSEY MFG. CO.

INDIANAPOLIS, INDIANA,



MANUFACTURERS OF

Adjustable Stove Trucks, Kraut, Slaw and Vegetable Cutters, Hoosier Saw Bucks, Wood Saw Frames, Towel Rollers, Potato Mashers, Rolling Pins, Steak Mauls, &c., &c. Write for Catalogue and Prices.

MECKLENBURG IRON WORKS, CHARLOTTE, N. C., JOHN WILKES, MANAGER.

MANUFACTURERS OF

Stamo Mills and Pumps for Gold Mines, and Mining Machinery of every description; Steam Engines, Portable and Stationary; Boilers and Saw Mills, with Reamy's Patent Feed and Backing Device. Also Manufacturers of the Celebrated Centennial Cotton Press.

H. H. HARVEY, Augusta, Me.,

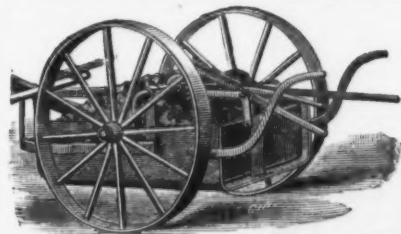
Manufacturer of RAILROAD, MINERS', BLACKSMITHS', STONE AND MARBLE CUTTERS', GRIST MILL AND BOILER MAKERS' HAMMERS AND TOOLS. CATALOGUE ON APPLICATION. SEE ILLUSTRATED ADVERTISEMENT IN THE FIRST ISSUE OF EACH MONTH. ESTABLISHED IN 1866.

THAD. A. NEELY'S MUNCIE ROLLER SKATE.

MUNCIE, - - - INDIANA.

ACKNOWLEDGED SUPERIOR TO ALL OTHERS.

SEE ILLUSTRATION IN NEXT ISSUE.



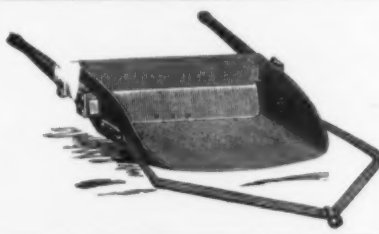
HASLUP'S PAT. WHEELED SCRAPER

Has great advantages over all others. It has More Capacity and is Easier Handled by Man and Team. Good on long or short hauls. Three sizes: 6, 12 and 16 cubic feet.

HASLUP'S ALL-STEEL DRAG SCRAPERS

Beat all others for capacity, durability, strength, light draft. Being ALL STEEL (except wood handles), are lighter, stronger and better made than any other. 3 sizes. Also, Township and Railroad Plows.

SIDNEY STEEL SCRAPER CO., Sidney, Ohio.



MONTGOMERY & CO.,

IMPORTERS

Stubs' Files, Tools and Steel, Grobet Swiss Files,

CHESTERMAN'S TAPES, RULES, ETC.,

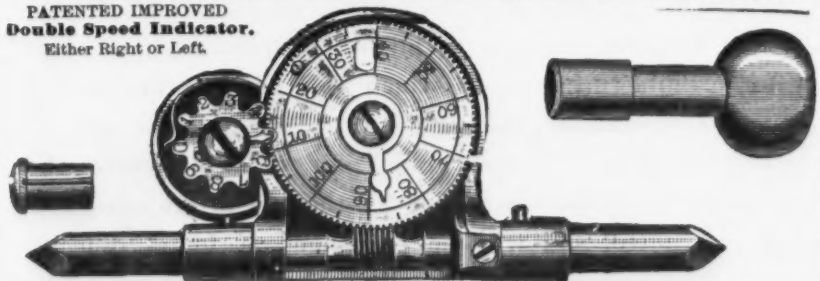
Hubert's French Emery Paper, Horseshoe Magnets, &c.

WM. SMITH & SON'S CELEBRATED MUSIC WIRE, Nos. 2 to 30.

French Sheet Steel, 3 1/4 in. wide, from 4 to 65 thousandths.

Machinists', Silversmiths', Jewelers', Die Stokers' and Sewing Machine Manufacturers' Supplies.

PATENTED IMPROVED Double Speed Indicator. Either Right or Left.



Geo. W. Montgomery, Geo. W. Church.

105 Fulton St., NEW YORK.

NICKEL PLATING.

(FIRST HANDS IN ALL THESE GOODS.)

MANUFACTURES:

Pure Nickel Anodes, Pure Nickel Salts, Gold Salts, Silver Salts, Copper Salts, Brass Salts, and Solutions.

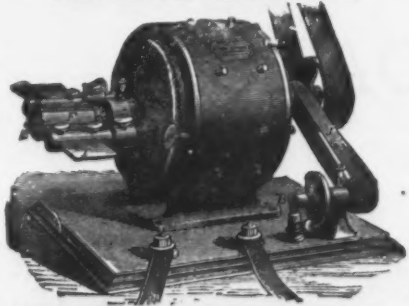
Cyanide Potash, Nickel, Silver, and Other Batteries.

MANUFACTURES:

Best Nickel and Silver Rouge, Crocus Composition, Tripoli Composition.

IMPORTERS

Vienna Lime, Pumice Stone, Sea Horse, Felt Wheels, Polishing Buffs, Polishing Brushes.



WESTON DYNAMO-ELECTRIC MACHINE

For Nickel, Bronze, Brass, Copper and Silver Plating.

A greater number in use than all others combined.

HANSON, VAN WINKLE & CO., Newark, N. J. New York Office, 92 Liberty St.

CATALOGUES AND PRICES ON APPLICATION.



HUGUNIN IMPROVED Adjustable SASH BALANCES, Mechanical Substitute for Weights, 3 Sizes. No. 1, 1 1/4 in. wide; No. 2, 1 1/2 in.; No. 3, 1 3/4 in.—for Sashes under 30, 30 and 40 lb. each. Sash with Hugunin Improved Balances work as with weights. They are fully warranted. The genuine have "Robt. B. Hugunin, Patentee and Solely Authorized Maker," cast on them. The unimproved (fraudulently copied style 1877), unrecommended, I offer at half price. The Hugunin New Sash Locks the cheapest, with widest range of usefulness. No clap trap to get your money, but simple, fully warranted mechanisms. Goods delivered in New York free. Address ROBT. B. HUGUNIN, Hartford, Conn., U. S. A., for goods, prices, &c.



J. M. SCHOONMAKER.

MANUFACTURER AND SHIPPER OF

CONNELLSVILLE COKE

Capacity of Mines, 2500 Tons Daily.

Siding connections with all lines of Railroads.

Office, 120 Water Street, PITTSBURGH, PA.

UNION FOUNDRY AND PULLMAN CAR WHEEL WORKS,

N. S. HOUTON, President.

CORRESPONDENCE SOLICITED AND ESTIMATES MADE ON

HEAVY MACHINERY, AND ALL SIZES OF FLY WHEELS, PULLEYS, &c.

Special Machinery for Grain Elevators, Grain Steam Shovels, &c., contracted for. Car Wheels and Car Castings at lowest rates.

Office, First National Bank Building, CHICAGO.

THE ROUSE PIPE AND BOLT WRENCH.

Drop Forged of Tool Steel.

ANY PARTS BROKEN BY FAIR USAGE REPLACED WITHOUT CHARGE.

R. R. ROUSE Manufacturing Co.,

Indianapolis, Ind.

New York Office, 16 Cortlandt St.



R. T. Pettebone Patent Shovels.

MADE IN ALL LEADING SIZES AND STYLES FOR

Railroad, Mining, Hardware and Furnace Trade

SUPERIOR QUALITY.

PAYNE PETTEBONE & SON, WYOMING, PA.

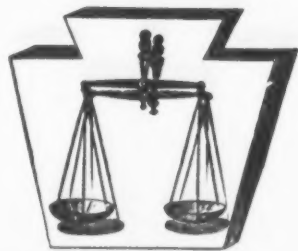
F. K. BOWES, Western Agent, Salesroom, 31 Dearborn St., Chicago, Ill.



BACK VIEW.

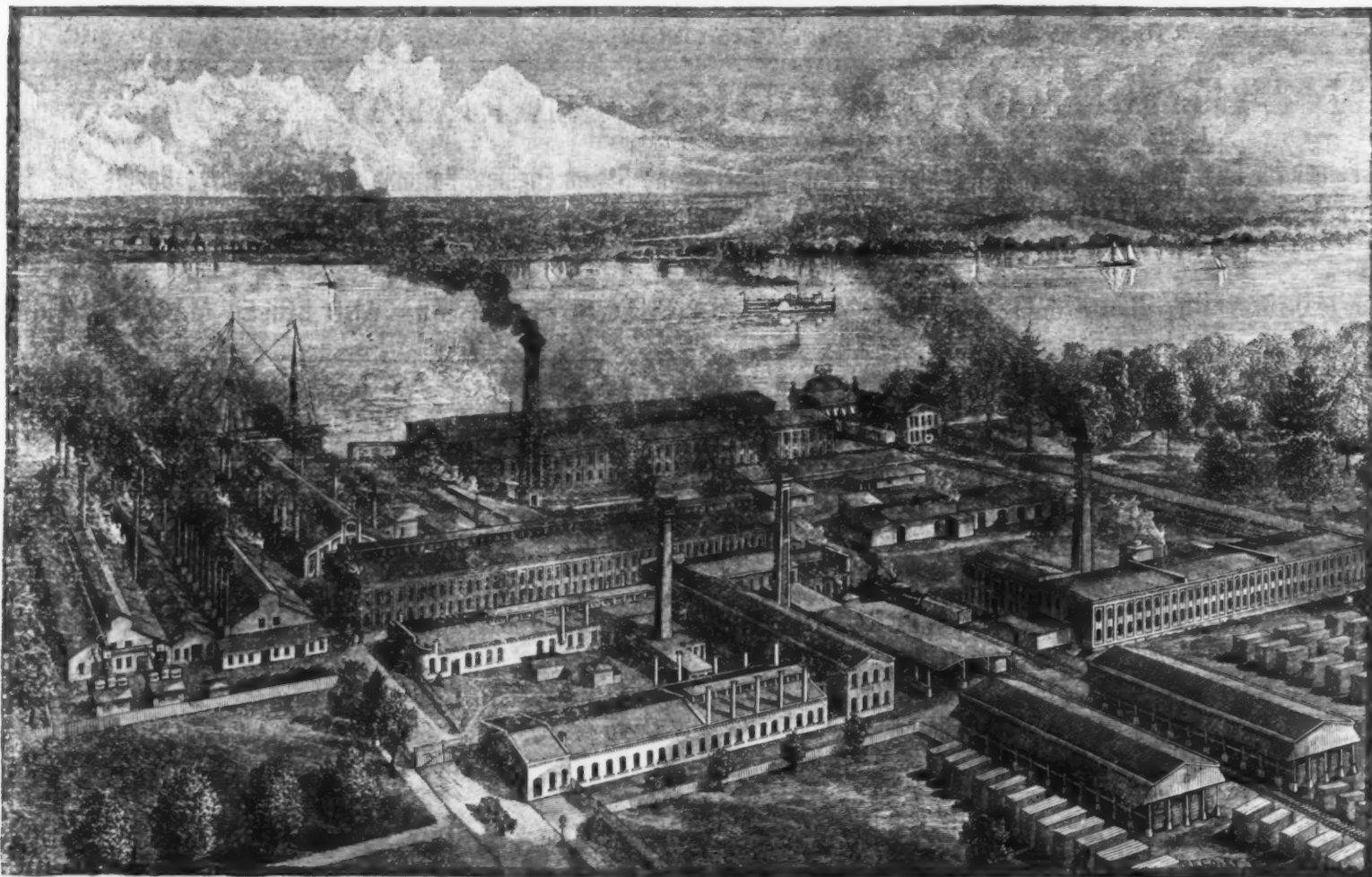
PATENTS. Thomas P. Simpson, Patent in Patent Office, Metallurgical Class. Have prepared or revised more than 16,000 cases. Personally acquainted with all the examiners. Terms moderate. Write for my Inventors' Guide. Office, No. 12 Federal Building, opposite Patent Office, Washington, D. C.

HENRY DISSTON & SONS,



KEYSTONE SAW, TOOL, STEEL AND FILE WORKS,

PHILADELPHIA, PA.



WE AGAIN DESIRE TO CALL THE ATTENTION OF THE TRADE to the goods manufactured by us, and assure them that it is our intention to maintain the present high standard of quality and to sell at the lowest prices consistent with superior quality and workmanship. Having had 45 years' experience in manufacturing Saws, we feel justified in saying that they are superior to all others from the fact of our having, by constantly experimenting at great cost, arrived at a state of perfection in machinery for manufacturing Saws which can only be attained by years of constant application and watchfulness. So jealous are we of keeping up their high standard that their making is intrusted to none but our most experienced men through their entire course of manufacture, several of whom have worked upon Disston's best grades for over 40 years, thus insuring, through long experience and constant attention, that perfection which cannot be attained in a few years, nor by those who are constantly changing their workmen. All goods bearing the brand of **Henry Disston & Sons** are fully warranted, and will be exchanged if found defective in any particular. We also manufacture a line of common Hand Saws, Buck Saws, &c., to which we call the attention of the Trade, as we are determined to sell these goods at as low a price as any of our competitors.

MEMORANDUM OF MEDALS.

HENRY DISSTON & SONS.

Franklin Institute, Pa.....	1856, Silver.
Maryland Institute.....	1860, Gold.
American Institute, New York.....	1869, Bronze.
Franklin Institute, Pa.....	1874, Silver.
Centennial, Philadelphia.....	1876, Bronze.
New South Wales.....	1877, Bronze.
Paris, France.....	1878, Gold.
Paris, France.....	1878, Bronze.

Sydney, New South Wales.....	1879, Bronze.
Melbourne, Australia.....	1880-81, Silver.
Matanzas, Cuba.....	1881, Gold.
Altona, Germany.....	1881, Gold.
Altona, Germany.....	1881, Silver.
Atlanta, Georgia.....	1881, Gold.
Louisville, Kentucky.....	1883, Bronze.
Louisville, Kentucky.....	1884, Bronze.

WE SHALL MAKE NO CHANGE IN OUR LIST OR DISCOUNTS FOR 1885.

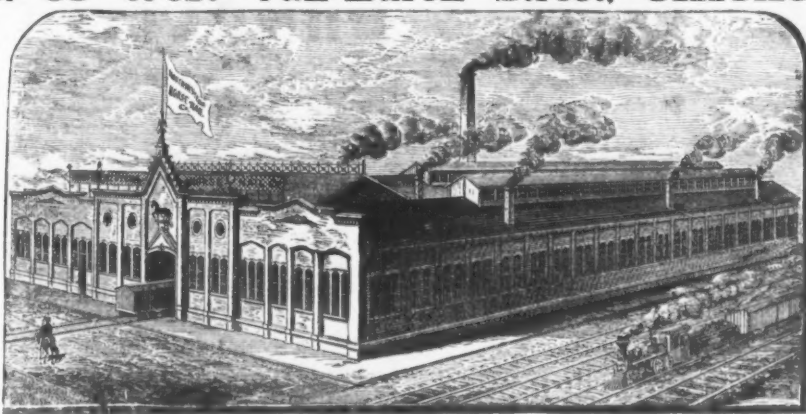
NORTHWESTERN HORSE NAIL CO.,

No. 88 West Van Buren Street, CHICAGO.

Regular
Head.



OUR NAILS are manufactured from the finest brand of Swedish Iron, of which we use the entire product.



IN QUALITY, uniformity of shape and style, they are unequalled.

They are the safest nail to drive.

City
Head.



For Sale by All the Leading Houses Throughout the United States.



COLD TEST OF IRON USED EXCLUSIVELY BY NORTHWESTERN HORSE NAIL CO.

A. W. KINGSLAND, Secretary.

BIT BRACES.

No. 6.
No. 8.
No. 10.

Bore into a corner or against the wall much faster and easier than the Ratchet Brace, and does just as good work, and easier in the clear, as the ordinary Brace.

AMIDON & WHITE,

SOLE MANUFACTURERS OF

AMIDON'S

CORNER BRACE,
BARKER IMPROVED BRACE,
UNIVERSAL BRACE,
IMPROVED RATCHET BRACE,
BUFFALO BALL BRACE.

FULL NICKEL PLATE OR PLAIN FINISH.

We are the SOLE OWNERS AND MANUFACTURERS of each of the above-named styles, and hereby caution the trade against purchasing the Barker Brace, or any other of our make, from any other manufacturer, both to insure from very inferior goods and from infringing on our patent rights.

No. 8.
No. 10.
No. 12.



AMIDON'S
BARKER
IMPROVED
BRACE.



AMIDON'S
UNIVERSAL
BRACE.

The Barker Improved Brace is too well known to require any further mention. The Universal Brace is newer, and is positively the best cheap Brace in the market, as it centers any sized Bit, and holds perfectly secure by a Cold Chisel Thumb-Screw.

CATALOGUES FURNISHED ON APPLICATION.

AMIDON & WHITE,

135 and 137 Main Street, Through to 10, 12 and 14 Quay Street, BUFFALO, N. Y.
W. H. GOLDEY, N. Y. City Agent, 103 Chambers St.

CROISSANT'S IMPROVED KELLER PAT. SAW SET.

CHAS. CROISSANT & BRO., Albany, N. Y.



The above cut represents the different parts of Croissant's Improved Keller Pat. Saw Set. The handles E and F are milled at I and V so that they fit perfectly, and when placed together the set can be operated independent of the screw L, which is used only to keep the handles together. The tooth set G is made from the best cast steel and tempered, and has a flat surface at both ends, thus forming six corners, any of which can be used in setting a saw. T is the socket in which the tooth set G fits. If at any time one of the corners of the tooth set G should break or otherwise become unfit for use the tooth set can be removed and one of the other corners brought into use by simply turning the tooth set G about and again placing it in position in socket T. This can be done until all of the corners have been used, thus really giving the operator six sets in one.

MASSEY'S
E & K PATENT
Iron and Woodworkers'

VICES

NO LOST MOTION.

All working parts steel. Hand holding handle pushes loose jaw to and grips work with one motion. Send for descriptive circular.

T. C. MASSEY,
Sole Manufacturer,
11 to 23 South Jefferson Street,
CHICAGO, ILL.

Eastern Depot: LINK BELT MACHINERY CO., 81 John Street, New York.

WILEY & RUSSELL MFG. CO.,

GREENFIELD, MASS.

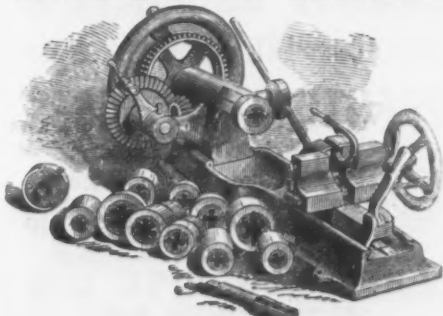
No. 10.

LIGHTNING
Bolt Cutter,

For Cutting Threads on Bolts and Pipe.

BOLTS 2-16 TO 1 1/2, } BY HAND.
PIPE 1-3 TO 2, }

Send for Price List.



SHAW NECK WARREN PLANTERS FIELD SOCKET

WITHINGTON & COOLEY

MANUFACTURING CO.

ESTABLISHED IN 1848

FARM AND GARDEN TOOLS - FROM - BEST CAST STEEL.

JACKSON, MICHIGAN, U.S.

NEW CHAMPION FORCE PUMP

HAS
Vacuum Chamber and Air Chamber,

Producing a continuous flow of water, both in suction and discharge. Works smoother and easier than any other force pump in the market. Has Seamless Drawn Brass Cylinders and no stuffing boxes. Never freezes in winter, and is not liable to get out of order. With Hose Attachment it is valuable as a fire protection, and for sprinkling lawns, gardens, &c. It is specially adapted for all kinds of wells—dug, drilled or driven—and for pumping water long distances from springs.

CLARK'S IMPROVED
Ratchet Stocks, Dies & Pipe Vises

FOR USE BY
Plumbers, Gas Fitters and Pump Dealers.

With the Ratchet Stock pipe can be threaded in a corner, down in wells, or in positions that would be inaccessible with other tools.
Send for Circulars and Price Lists to

CLARK BROTHERS, Mfrs., Belmont, N. Y., U. S. A.

129 & 131 So. Clinton St., CHICAGO, ILLINOIS.

KNISELY & MILLER,

MANUFACTURERS OF

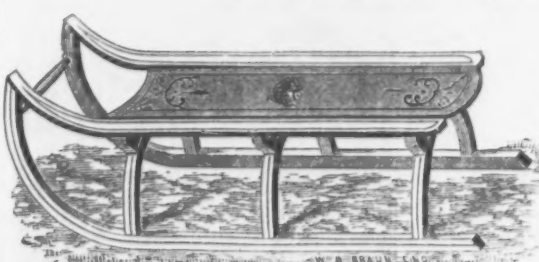
CORRUGATED IRON,

PAINTED OR GALVANIZED, STRAIGHT OR CURVED.

THREE SIZES OF CORRUGATION.

We carry at all times a large stock from which we can fill orders promptly. Send for Catalogue and Prices.

HEINZ & MUNSHAUER,
BUFFALO N. Y.



Manufacturers of
BIRD CAGES,
REFRIGERATORS,
CHILDREN'S SLEIGHS,
WATER COOLERS,
COAL HODS
AND VASES.

Send for Illustrated Catalogue.

PERFECTION WINDOW CLEANER.

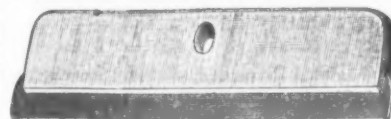


SIMPLE,
USEFUL
AND
DURABLE.

STAPLE
AS
MOPS
OR
BROOMS

Beware of Infringements.

FLOOR SCRUBBERS.



Perfection Window Cleaner Co.
205 KINZIE STREET,
CHICAGO, ILLINOIS, U. S. A.

BUFFALO HAMMER COMPANY.

Successors to HENRY W. KIP.

BUFFALO, N. Y.

MANUFACTURERS OF

Solid Steel Hammers,

Forged From The Best Crucible Steel.
All Hammers Fully Warranted.

DROP FORGINGS A SPECIALTY.

SAM'L A. HAINES, General Sales Agent,
88 Chambers St., - New York City.

Clayton Brothers,
BRISTOL, CONN.,
Manufacturers of

Cast Shears,

Screw Drivers, Kitchen Knives, Roller
Knives, &c.

The Best and Cheapest in the Market. Send for Prices.

GEO. H. CREED,
SHIP CHANDLERY,
103 Reade Street, New York.

Manufacturers of and Wholesale Dealers in
Cotton and "Long Flax" Sail Duck
Cotton and Linen Havens,
Creed's Patent Ships' Crews. Heltman's Wire Rope
Splicers. Agent for Raymond's American Crane Oil
for lubricating Cylinders and Valves.

Grindstones, Emery, &c.

Walter R. Wood
GRINDSTONES.

Berea, O., Nova Scotia, & other brands.
285 and 287 Front Street, New York.

GEO. CHASE,

The largest manufacturers in the world of

OIL STONE

Of all description.

107th Street and Harlem River,
Send for Illustrated Price List. NEW YORK.

McDERMOTT & BEREA STONE CO.

ALL SIZES & GRADES

SEND FOR PRICES

GRINDSTONES

CLEVELAND, O.

OHIO GRINDSTONE COMPANY.

H. H. CLOUGH, Pres. L. P. HALDEMAN,
J. M. WORTHINGTON, V. Pl. Secy and Treas.

MANUFACTURERS OF

GRINDSTONES

OF ALL KINDS.

127 SUPERIOR ST
CLEVELAND, OHIO.

WORTHINGTON & SONS,

MANUFACTURERS OF

GRINDSTONES,

ALSO

SCYTHE STONES

OF ALL SHAPES.

BEST CRIT KNOWN.

Finest Put Up Goods in the Market.

Cor. Front and River Sts., CLEVELAND, OHIO.



Issues Policies of Insurance after a careful inspection of the Boilers,
COVERING ALL LOSS OR DAMAGE TO
Boilers, Buildings and Machinery,
ARISING FROM
STEAM BOILER EXPLOSIONS.
The Business of the Company includes all kinds of Steam Boilers.
For information concerning the plan of the Company's operations can be obtained at the
COMPANY'S OFFICE, HARTFORD, CONN.,
or at any agency.

J. M. ALLEN, Pres. W. B. FRANKLIN, Vice-Pres. J. B. Pierce, Sec.

Board of Directors.

J. M. ALLEN, President.
ELIUD J. HENDER, President. Aetna Fire Ins. Co.
FRANK W. CHENEY, of Cheney Bros. Silk Mfrs.,
Hartford and New York
CHARLES M. BEACH, of Beach & Company,
Hartford
DANIEL PHILLIPS, of Adams' Express Company,
Hartford
GEO. M. HARTHOLMEW, President Holyoke Water
Power Company
RICHARD W. H. JARVIS, President Colt's Pat. Fire
Arms Manufacturing Co.
THOMAS O. ENDERS, of the Aetna Life Insurance Co.,
Hartford
LEVERETT BRAINARD, of the Case, Lockwood & Brainard Co.,
Hartford
GEN. WM. B. FRANKLIN, Vice-President Colt's Pat. Fire Arms Mfg. Co.
GEO. CROMPTON, Crompton Loom Works Worcester, Mass.
HON. THOMAS TALBOT, Ex-Governor of Massachusetts, Lowell.
NEWTON CASE, of the Case, Lockwood & Brainard Co., Providence.
WM. S. SLATER, Cotton Manufacturer, Providence.
NELSON HOLLISTER, of the State Bank, Hartford.
CHAR. T. PARRY, of Baldwin Locomotive Works, Philadelphia.
HON. HENRY C. ROBINSON, Attorney at Law, Hartford.

G. A. CROSBY & CO.
MANUFACTURERS OF
Presses, Dies,
AND
Special Machinery
FOR
Sheet Metal Workers.
Market and
RANDOLPH ST.
Chicago, Ill.

Bit Braces.

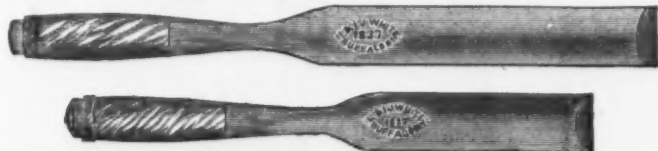
Amidon Brace, 8 to 14 in. sweep.
Barker " " "
Empire " " "
Buffalo Ball Brace.
Brace Wrench.
Tov Braces, &c.



E. R. SAXTON,
31 Lloyd St.,
BUFFALO, N. Y.,
Sole Manufacturer.

Send for Illustrated Catalogue, Price List and Discounts.

ESTABLISHED 1837.



L. & I. J. WHITE,
MANUFACTURERS OF
EDGE TOOLS and MACHINE KNIVES
Coopers', Carpenters' and Ship Tools, Cleavers, &c.
SOCKET CHISELS,
FIRMER, FRAMING, MILLWRIGHT, PAVING AND CORNER.
310, 312 & 314 EXCHANGE STREET, BUFFALO, N. Y.

CAST TEA KETTLES.

PATENT OR FLAT BOTTOM.

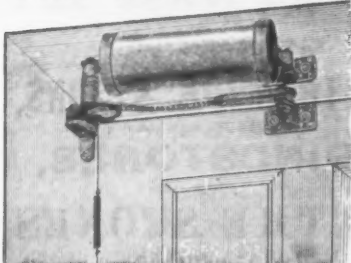
JAPANNED OR GALVANIZED.

Pat. Bottom have **SAFETY FRONT.**

Chemung Hollow Ware Works,
ELMIRA, - - N. Y.

THE SHAW DOOR CHECK AND SPRING.

GREAT REDUCTION IN PRICE.



The SHAW DOOR CHECK AND SPRING CO. have removed to their new factory, and with their increased facilities for manufacturing their goods have decided to reduce the price of each Spring \$1.00 from former list, and thereby bring the machine within the reach of all. The SHAW CO. are the owners of the oldest patented device for closing doors noiselessly, and with their new improvement produce the only check and spring which the trade can sell as general hardware. The same spring can be applied to either hinge or jamb side of both right or left hand doors.

SHAW DOOR CHECK AND SPRING CO.

MANUFACTURERS AND SOLE AGENTS,
Office and Factory, 164 High St., Boston, Mass.

BRANCH OFFICES: 77 Rensselaer St., New York; 339 Lake St., Chicago, Ill.

JOHN T. LEWIS & BROS.,
No. 231 South Front St.,
PHILADELPHIA.



TRADE MARK.
MANUFACTURERS OF
Pure White Lead, Red Lead, Litharge,
Orange Mineral, Linseed Oil,
AND PAINTERS' COLORS.

JOHN JEWETT & SONS
Manufacturers of the well-known brand of
WHITE LEAD.



TRADE MARK.
ALSO MANUFACTURERS OF
LINSEED OIL.
181 Front Street, NEW YORK.



The Atlantic White Lead and Linseed Oil Co.,
Manufacturers of
White Lead (Atlantic), Red Lead, Litharge, Glass Makers' Litharge and Orange Mineral;
LINSEED OIL,
Raw, Refined and Boiled.
ROBERT COLGATE & CO.,
287 Pearl St., NEW YORK.

SALEM LEAD COMPANY,
CORPORATORS AND MANUFACTURERS OF
PURE WHITE LEAD.

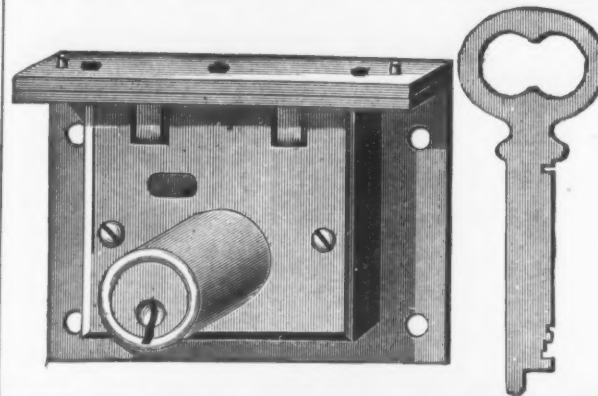


ALSO MANUFACTURERS OF
Lead Pipe and Narrow Sheet Lead.
SALEM, MASS.
F. A. BROWN, Treas.

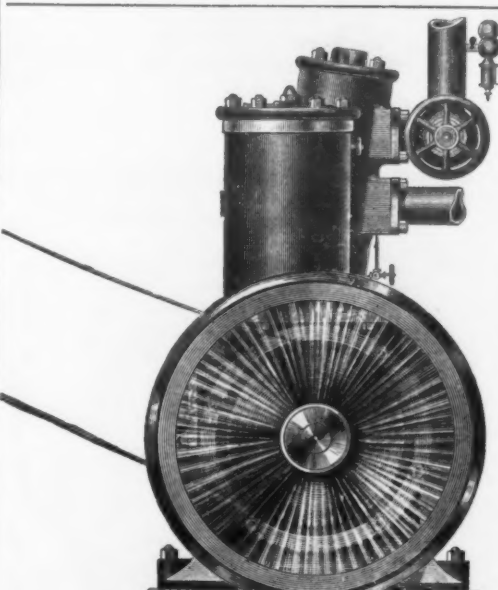


Out one-half size.

THE CHARLES PARKER CO.,



MERIDEN, CONN.,
Manufacturers of
CABINET LOCKS.



1000 Engines
NOW IN USE.
30,000 H.-P.
NOW RUNNING.
Sales 2000 H.-P.
PER MONTH.

Send for Illustrated Circular and Reference List.

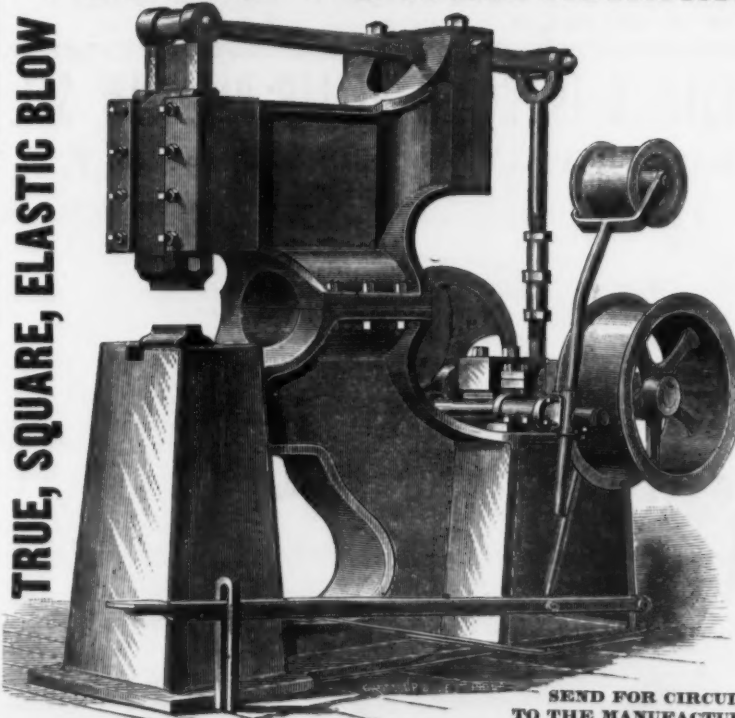
The
Westinghouse Machine Company,
PITTSBURGH, PA.

THE WESTINGHOUSE AUTOMATIC ENGINE

SALES DEPARTMENT CONDUCTED BY

WESTINGHOUSE, CHURCH, KERR & CO., 17 Cortlandt Street, New York.
FAIRBANKS, MORSE & CO., Chicago, Cincinnati, Cleveland, Louisville and St. Paul.
FAIRBANKS & CO., St. Louis, Indianapolis and Denver.
PARKE & LACY, San Francisco, and Portland, Oregon.
PARKE, LACY & CO., Salt Lake City, Utah.
MAY, HIRSCH & KAEFFEL, Sydney and Melbourne, Australia.

"VULCAN" POWER HAMMER



TRUE, SQUARE, ELASTIC BLOW

STEEL HELVE, RUBBER CUSHIONED

SEND FOR CIRCULAR TO THE MANUFACTURERS

W. P. DUNCAN & CO. BELLEFONTE, PA.



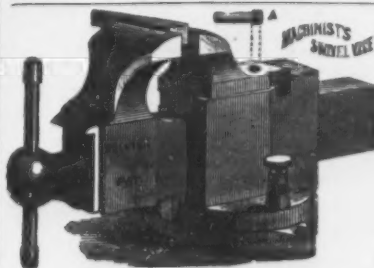
Bemis & Call Hardware & Tool Co.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite combinations of a regular Nut Wrench, thus making a combination which has no equal.

For Circulars and Price List, address

BEMIS & CALL HARDWARE & TOOL COMPANY, Springfield, Mass.



PRENTISS' PAT. VISES,
Adjustable Jaw.
Stationary or Pat. Swivel Bottoms.
ADAPTED TO ALL KINDS OF VISE WORK. ALSO
"PEERLESS" SWIVEL PIPE GRIP,
FITS ANY VISE. SOLD BY THE TRADE.
PRENTISS VISE CO.,
93 Day Street, New York.
SOLE PROPRIETORS. SEND FOR CIRCULAR



Charles Kellogg. C. S. Maurice. Thos. C. Clarke. C. Macdonald. Geo. S. Field. Edmund Hayes.

UNION BRIDGE COMPANY,Works: Athens, Pa. Works: Buffalo, N. Y.
Late Kellogg & Maurice. Capacity, 14,000 tons. (Late Central Bridge Works.) Capacity, 12,000 tons.

CIVIL ENGINEERS AND CONSTRUCTORS

Iron & Steel Bridges, Viaducts, Roofs,

ELEVATED RAILROADS, MARINE PIERS &c.

For Plans, Estimates and Tenders, address

UNION BRIDGE COMPANY, 52 Wall Street, NEW YORK.

TELEPHONE CALL: NEW 203.

PRIZE MEDALLISTS.

Exhibitions of 1862, 1866, 1867, 1873, 1874, and only Award and Medal for Noiseless Steel Shutters at Philadelphia 1876, Paris 1878, and Melbourne 1881.

CLARK, BUNNETT & CO., Limited,

Late CLARK & COMPANY,

Original Inventors and Sole Patentees of

Noiseless, Self-Coiling, Revolving Steel Shutters.

Fire and Burglar Proof. Also, Improved Rolling Wood Shutters of various kinds, and Patent METALLIC VENETIAN BLINDS.

Office and Manufactory, - - 162 & 164 West 27th Street, New York.

MERIDEN MALLEABLE IRON CO.,

MERIDEN, CONN.,

Manufacturers of a Full Line of the Latest Improved

Patent Adjustable Iron Planes.

THE BEST NOW IN THE MARKET.

Send for Full Descriptive Catalogue.

New York Office, 37 Barclay St. Boston Office, 147 Franklin St.

**BURGESS STEEL & IRON W'KS**

MANUFACTURERS OF

CRUCIBLE AND OPEN-HEARTH STEEL,

Hot Polished Shafting,

SAFE, JAIL, TOE-CALK AND TIRE STEEL,

Iron and Steel Boiler Plate, Tool, Lay Steel and U. S. Norway Iron, Soft Steel, and Iron Center Cast Plow Steel.

PORTSMOUTH, OHIO.

THE SWIFT MILL.

ESTABLISHED 1845.

The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. We make more than 30 styles.

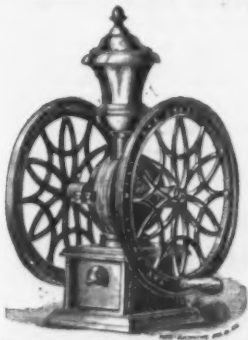
ALSO, LANE'S PORTABLE COFFEE ROASTER.

Will roast 30 to 40 lbs. at once, and can be used as a stove at other times. Send for descriptive list to Manufacturers.

LANE BROS., Poughkeepsie, N. Y.

Also Sold by Leading Wholesale Houses.

Our agents, John H. Graham & Co., 113 Chambers St., New York carry a full line of our goods, and will be pleased to serve you a factory prices.

**HANDLES FOR MANUFACTURERS.**

From Selected Stock, Thoroughly Seasoned, Well Made.

Orders solicited from close buyers who want good work

RIPLEY MANUFACTURING CO.,

Unionville, Conn.,

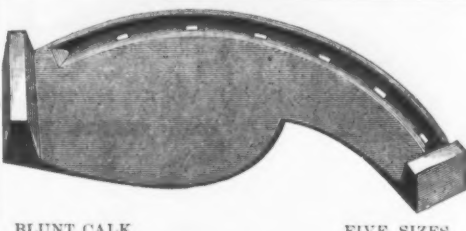
Manufacturers of

"Common Sense" Mouse Traps, Mallets, Porcelain-Lined Lemon Squeezers, Boot Jacks, Faucets and Hardware.



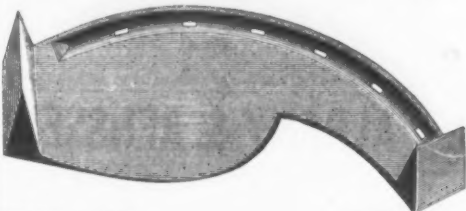
THE HARTFORD HAMMER CO., Hartford, Conn.

Manufacturers of Solid Cast Steel Hammers. All Hammers stamped "HARTFORD" are fully WARRANTED - See first issue of each month. JOHN H. GRAHAM & CO., Sole Agents, 113 Chambers St. New York.



BLUNT CALK.

FIVE SIZES.



SHARP CALK.

FIVE SIZES.

**MOUNT CARMEL
OX SHOES**

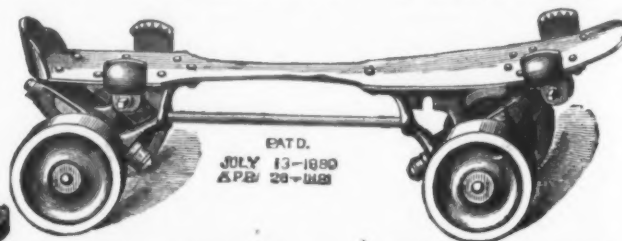
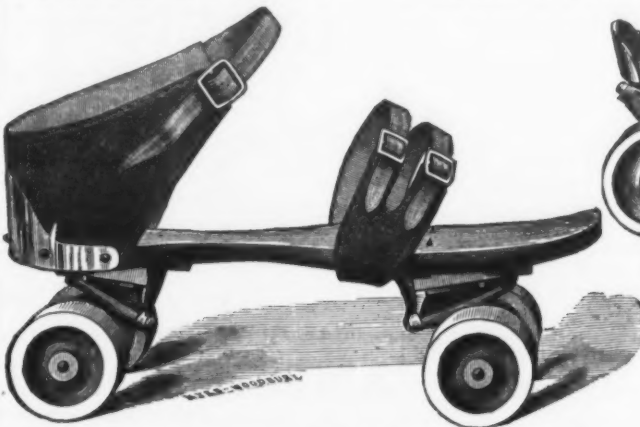
WITH

STEEL TOE CALKS.*The Best and Cheapest Shoes Made.**Warranted to Outwear any Other Shoe.*

WE ALSO MANUFACTURE

MILLER'S PATENT FORGED OX SHOES.

Superior in many points to any other Forged Shoe made and at as low price.

CORRESPONDENCE SOLICITED.**WOODRUFF, MILLER & CO.,** Mount Carmel, Conn., U. S. A.**WINSLOW'S VINEYARD ROLLER SKATES.**

THE STANDARD ROLLER SKATES OF THE WORLD

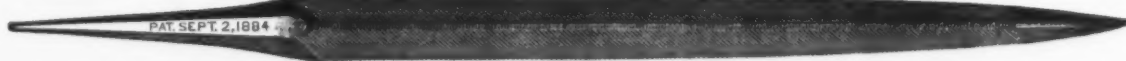
These Skates are in use in over 2000 Rinks, and in every instance afford the fullest satisfaction. Address all orders and inquiries to

Frank E. Winslow,

St. James Avenue and Clarendon Street, BOSTON MASS.

New American File Company,

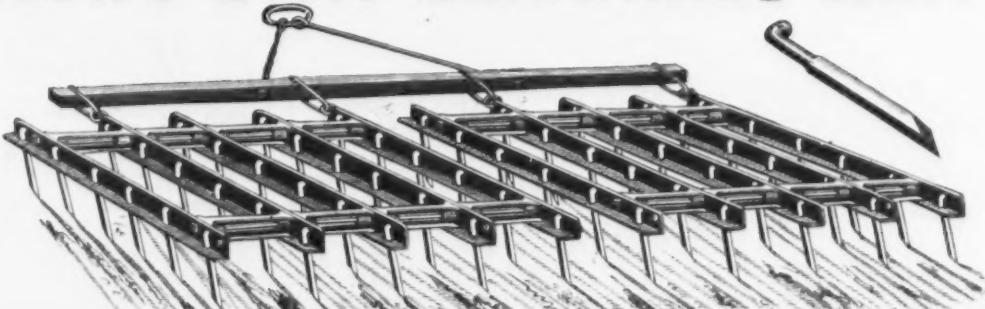
PAWTUCKET, R. I., U. S. A.



NOTICE.—Save 300 to 400 per cent. in Money and Time.

The testimonials in *Iron Age*, page 18, September 18 and 25, will convince most any one that our guarantee of this File doing the work of any two of any other brand, or money refunded, "is perfectly safe." Now, competitors who think they have made the same File for years can find out their mistake with a very little trouble, and save themselves money in advertising this File and mortification from being called stupid or otherwise. This class of File cannot be made so serviceable by any other method but one, and that one is covered by Caveat, filed by Patentee of above File.**Buford's Steel Smoothing Harrow**

Reversible, Straight or Slant Tooth.



The Cheapest Harrow in the Market.

MANUFACTURED EXCLUSIVELY BY

THE ROCK ISLAND PLOW CO., (B. D. BUFORD & CO.) Rock Island, Ill.

Write for Catalogue and Prices.

**COAL
VASES**SECOND TO NONE
IN THE WORLD

—FOR—

QUALITY,

DECORATION and
SELLING MERITS.**DO NOT BUY**

BEFORE SEEING OUR

Large and Magnificent Assortment.

Catalogues on Request.

Established 1843.

GEO. D. WINCHELL MFG. CO.,

Cor. Bank and Riddle Streets,

CINCINNATI - - - OHIO.

MILLER, METCALF & PARKIN,
Pittsburgh, Pa.,
Manufacturers of
CRESCENT STEEL,
In Bars, Sheets, Cold-Rolled Strips, &c.
Polished, Compressed Drill Rods and Wire.
Warranted equal to any imported in quality, finish and accuracy.
Also Common Grades.

J. & RILEY CARR,
BAILEY LANE WORKS,
Sheffield, - - England.
MANUFACTURERS OF
PATENT WELDED STEEL FOR DIE BLOCKS.
SHOE DIE CUTTERS, LEATHER and PAPER DIE CUTTERS,
TOBACCO and WOOD PLANER KNIVES, MACHINE
IRONS, SKATE RUNNERS, &c.
The two materials are united together by a special process of our own, not by
welding under the Hammer, but in the mold while the metal is in a molten state,
thus producing an absolutely solid ingot impossible to break or tear asunder, and
SUPERIOR TO ANYTHING ELSE IN THE MARKET.
Warehouse, 30 Gold Street, NEW YORK.

S. & C. WARDLOW,
Sheffield, England,
Manufacturers of the Celebrated
**Cast and Double Shear
STEEL.**
In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table Knives, Mining
Tools, Dies, Files, Clock and other Springs, and Tools of every variety.
Warehouse, 95 John Street, New York.
WILLIAM BROWN, Representative.

JESSOP'S BEST TOOL STEEL
IN GREAT VARIETY OF SIZES.

Gold Medals awarded
at Exhibitions of
Paris, 1875 and
Melbourne, 1881.

ROCK DRILL STEEL,
in bond or duty paid.
Sheet Steel,
Best Circular
Saw Plates,
Double Shear
Steel,
Die Steel, &c.
MANUFACTORY,
Sheffield, England.

**JESSOP'S
STEEL**

As a SPECIALTY, we
offer our
Best Tool and
Die Steel,
ANNEALED SOFT.
Also
Annealed Die
Blocks,
from Stock or on im-
portation orders at
short notice.
Branch Warehouses
Throughout the
United States and
Canada.

WILLIAM JESSOP & SONS, LIMITED,
91 JOHN STREET, NEW YORK.

CLEVELAND ROLLING MILL CO.,
CLEVELAND, OHIO.
MANUFACTURERS OF

**BESSEMER AND SIEMENS-MARTIN STEEL BLOOMS AND BILLETS,
BESSEMER STEEL RAILS, IRON RAILS & FASTENINGS.**

Steel Street Ralls, Wire, STEEL TIRE and FORGINGS, Iron and Steel Angles, Bar and
Spring Steel, SOFT WELDING STEEL for Tools and Agricultural Work,
Corrugated Roofing and Siding, IRON and STEEL BOILER PLATE,
Galvanized and Black Sheet Iron, STANDARD CAST STEEL.

WESTERN AGENCY, 91 Lake St., Chicago, NEW ENGLAND AGENCY, 239 Franklin St., Boston,
N. D. PRATT, Agent, JOHN WALKER & CO., Agents, C. DICKERSON, Agent,
New York Agency, 75 Astor House, CINCINNATI AGENCY, 151 Walnut St., CHARLES R. MELISH, Agent.

W. W. SCRANTON,
President.

WALTER SCRANTON,
Vice-President.

E. F. KINGSBURY,
Sec'y and Treas.

THE SCRANTON STEEL COMPANY,
MANUFACTURERS OF
STEEL RAILS & BILLETS.
Works at Scranton, Pa.
New York Office, - - - 56 Broadway.

THE MIDVALE STEEL CO.,
NICETOWN, PHILADELPHIA.

Best Warranted Cast Steel for Machinists' Tools,
Taps, Dies, Punches, Shear Blades, Chipping Chisels and Granite Rock Drills,
Extra Mild Center Steel, special for Taps;
ALSO,
MACHINERY and CAST SPRING STEEL HEAVY and LIGHT FORGINGS.
Warehouse, No. 12 North 5th St., Philadelphia.
Address A. M. F. Watson, General Sales Agent.

G. W. Bradley's Edge Tools.

Butchers' Cleavers,
Butchers' Choppers,
Axes and Hatchets,
Grab Hoes and Mattocks,
Mill Picks,
Box Chisels and Scrapers,

Ring Rush Hooks,
Ax Eye Rush Hooks,
Socket Rush Hooks,
Wait's Ship Carpenters' Tools,
Carpenters' Drawing Knives,
Coopers' and Turpentine Tools.

OR SALE BY

MARTIN DOSCHER, Agent, 85 Chambers Street, N. Y.

STEEL Gautier Steel.
See Page 3.

LABELLE STEEL WORKS.
SMITH, SUTTON & CO.,
MANUFACTURERS OF ALL KINDS OF
STEEL.

Also Springs, Axles, Rake Teeth, &c.
OFFICE & WORKS, Ridge, Lighthill & Belmont Sts., & Ohio River, Allegheny.
Post Office Address, PITTSBURGH, PA.
Represented at Boston by WETHERELL BROS., 31 Oliver St.; at Philadelphia by JAMES C. HAND & CO.,
614 and 616 Market St.; at Cleveland by CONNIT, WICK & CO., 123 Water St.

ALBANY & RENSSLAER IRON & STEEL CO.,
TROY, N. Y.,
MANUFACTURERS OF

BESSEMER STEEL RAILS,
FISH PLATES, BOLTS, NUTS, SPIKES, &c.

Machinery Steel, Merchant and Ship Iron.

CHESTER GRISWOLD, V.-Pres't, Duncan Building, 11 Pine St., N. Y. City.

FRANCIS HOBSON & SON,
97 John Street, NEW YORK.

Sole Manufact'rs of "CHOICE" Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England.

CHAS. HUGILL, Agent.

ANDERSON, DU PUY & CO.,
(Successors to ANDERSON & CO.) Manufacturers of all Descriptions of
STEEL.

Tool, Machinery, Agricultural, &c.

Works and Office at Chartiers Station P. & L. E. R. R. Branch Office, No. 107 Wood Street,
PITTSBURGH, PA.

D. H. KENT & CO., Limited, Agents, 1009 Arch St., Phila., Pa. M. T. MILES & SON, Western Agents,
170 Lake St., Chicago.

80 John St., **F. W. MOSS,** NEW YORK.
STEEL "MOSS" and FILES
"MOSS" and
"MOSS & GAMBLE'S"
IMPROVED MILD-CENTERED CAST STEEL FOR TAPS, &c.

Warranted Superior to any Steel in the Market, either
English or American, for every purpose.

Also,
Combination Chrome Steel and Iron for
Safes, Jails and Deposit Vaults.

Send for Circular
and
Price List

Chrome Steel Works,

Kent Avenue and Keap Street,
BROOKLYN, E. D., N. Y.

Chicago Branch,
S. D. KIMBARK, Agent.

Cincinnati Branch,
N. E. cor. 5th & Main Streets.

THE MONTGOMERY IRON & STEEL COMPANY,
WORKS AT DANVILLE, PA.

PIG IRON, T AND STREET RAILS,

RAIL JOINTS AND SPIKES,

Bar Iron, Mine Car Wheels, Axles and Breaker Machinery.

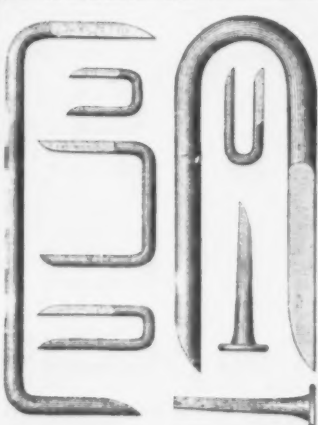
W. E. C. COXE, President,
Reading, Pa.

F. P. HOWE, Gen'l Supt.,
Danville, Pa.

PITTSBURGH BESSEMER STEEL CO.
(LIMITED),

STEEL RAILS
LIGHT RAILS A SPECIALTY.

P. O. Address, 48 Fifth Avenue, Pittsburgh, Pa.



FLORENCE TACK CO.,
FLORENCE, MASS.

Manufacturers of every variety of

Tacks, Small Nails,

DOUBLE-POINTED TACKS,

AND

STAPLES

From 1-4 to 3 1-4 in.

R. MUSHET'S
Special Steel

FOR
LATHES, PLANERS, &c.

Turns out at least double work by increased speed
and feed, and cuts harder metals than any other
steel. Neither hardening nor tempering required.
Sole Makers,

SAMUEL OSBORN & CO.,
Sheffield, England.

Represented in the United States by

B. M. JONES & CO.,
Nos. 11 & 13 Oliver Street, BOSTON.

NAYLOR & CO.,
99 John St., New York,

IMPORTERS OF

STEEL AND IRON RAILS,

Steel Tires and Axles, Tin and Terne Plates.

Swedish and Norway Iron,

Bessemer Steel and Iron

WIRE RODS,

Pig Iron, Spiegeleisen, Ferromanganese,
Scrap Steel and Old Iron Rails.

SELLING AGENTS

FOR

Norway Steel and Iron Company,

SOUTH BOSTON.

Manufacturers of

STEEL COMPRESSED SHAFING

"Benzon" Homogeneous Plates

For Rollers, Fire-boxes, &c.

SPRING STEEL,

And all other kinds of

Martin-Siemens Steel and Iron.

**The Iron-Masters'
LABORATORY.**

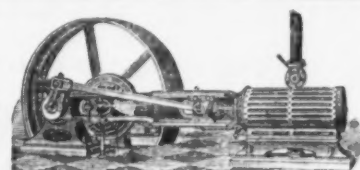
Exclusively for the

Analysis of Ores of Iron, Pig and Manufactured
Iron, Steels, Limestone, Clays,
Slags and Coal for Practical
Metallurgical Purposes.

339 Walnut St., Philadelphia.
With Branch at Warrenton, Virginia,
J. BLODGET BRITTON.

This laboratory was established in 1866, at the in-
stance of a number of practical Iron Masters, ex-
pressly to afford prompt and reliable information
upon the chemical composition of the substances
above mentioned, for smelting and refining pur-
poses, the object being to make it at once a con-
venient, practically useful, and comparatively
inexpensive adjunct to the Furnace, Forge and
Rolling Mill.

CHARGES TO IRON WORKS:
For determining the per cent. of Pure Iron in
an Ordinary Ore..... \$4.00
For the per cent. of Pure Iron, Sulphur and
Phosphorus in "do."..... 12.50
For each additional constituent of usual oc-
currence..... 1.50
For those of unusual occurrence or difficult
to determine, the charge must necessarily
depend upon circumstances.
For determining the per cent. of Sulphur or
Phosphorus in Iron or Steel..... 7.00
For each additional constituent of usual oc-
currence..... 6.00
For the per cent. of Carbonate of Lime, and
insoluble Silicious Matter in a Limestone..... 10.00
For each additional constituent..... 2.00
For the per cent. of Water, Volatile Constitu-
tible Matter, fixed Carbon, and Ash in Coal..... 12.50
For determining the constituents of a Clay, Slag,
Coke, or of an Ash in Coal, the charges will cor-
respond with those for the constituents of an Ore.
For a written opinion or letter of instruction
the charge must necessarily depend upon cir-
cumstances.
Printed instructions for obtaining proper average
samples for analysis furnished on application.



The Cummmer Engine. Awarded Gold Medals and
All Highest Premiums for Best Automatic Engine at
both Cincinnati and Louisville in 1883. Send for 150-
Page Illustrated Catalogue. Address
THE CUMMER ENGINE CO., Cleveland, Ohio.

"BRIER HILL PIG IRON."

EASTERN AGENCIES:
E. P. Cutler & Co., No. 15 Oliver St., Boston, Mass.
Geo. W. Jones & Co., No. 4 Hanover St., New York City.
Hogan & Elliott, 413 Walnut St., Philadelphia, Pa.
The BRIER HILL IRON and COAL CO.,
YOUNGSTOWN, OHIO.

A. PARDEE, Hazleton, Pa. J. G. FELL, Phila

A. PARDEE & CO.,

237 South Third Street,

PHILADELPHIA,

No. 111 Broadway, New York,

MINERS AND SHIPPERS OF

Lehigh Coals.

The following superior and well-known Lehigh
coals are mined by ourselves and firms connected
with us, viz.:

A. Pardee & Co. HAZLETON,
Pardee, Bro. & Co. CRANBURY,
Calvin Pardee & Co. SUGAR LOAF.
Pardee, Sons & Co. LATTIMER.
HOLLYWOOD.
MT. PLEASANT

THOS. FIRTH & SONS, Limited, SHEFFIELD, Crucible Cast Steel.

JERE. ABBOTT & CO..

AGENTS AND IMPORTERS OF

SWEDISH IRON,

35 Oliver St., BOSTON. 23 Cliff St., NEW YORK.

GUSTAF LUNDBERG,

AGENT FOR

N. M. HÖGLUND'S SONS & CO.,

OF STOCKHOLM.

SWEDISH & NORWAY IRON,

38 KILBY STREET, BOSTON.

ALBERT POTTS, Philadelphia Agent, 234 & 236 N. Front Street.

PAGE, NEWELL & CO.,

139 MILK STREET, BOSTON.

IMPORTERS OF

Swedish and Norway Iron,

INCLUDING

Charcoal, Siemens-Martin and Bessemer Productions, Bars, Shapes, Rods, Billets, Blooms, Wrought Scrap Iron, Scrap Steel, &c.

DELIVERIES MADE AT ALL PROMINENT AMERICAN, CANADIAN AND PROVINCIAL PORTS.

Swedish (Norway) Iron & Steel.

Lewander & Co.,

AGENTS FOR

L. G. Bratt & Co., of Gothenburg, Sweden.

BRANCH OFFICE:
154 Lake St.,
CHICAGO.

MAIN OFFICE:

12 Post Office Square, Boston, Mass.

GAS ENGINES

FOR PUMPING AND LIGHT POWER,

AND

Crown Water Meters

NATIONAL METER COMPANY,

51 Chambers Street, NEW YORK.

JOHN C. KELLEY, Prest.

Jarecki's Screw Plate and Pipe Cutter.

WRITE FOR DISCOUNT AND DESCRIPTION.

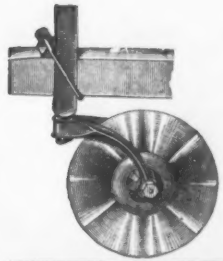


No. 1 Cut off and Thread 1/2, 3/4, 1, 1 1/4, 1 3/4, 2, 2 1/2, 3, 3 1/2, 4, 4 1/2, 5, 5 1/2, 6, 6 1/2, 7, 7 1/2, 8, 8 1/2, 9, 9 1/2, 10, 10 1/2, 11, 11 1/2, 12, 12 1/2, 13, 13 1/2, 14, 14 1/2, 15, 15 1/2, 16, 16 1/2, 17, 17 1/2, 18, 18 1/2, 19, 19 1/2, 20, 20 1/2, 21, 21 1/2, 22, 22 1/2, 23, 23 1/2, 24, 24 1/2, 25, 25 1/2, 26, 26 1/2, 27, 27 1/2, 28, 28 1/2, 29, 29 1/2, 30, 30 1/2, 31, 31 1/2, 32, 32 1/2, 33, 33 1/2, 34, 34 1/2, 35, 35 1/2, 36, 36 1/2, 37, 37 1/2, 38, 38 1/2, 39, 39 1/2, 40, 40 1/2, 41, 41 1/2, 42, 42 1/2, 43, 43 1/2, 44, 44 1/2, 45, 45 1/2, 46, 46 1/2, 47, 47 1/2, 48, 48 1/2, 49, 49 1/2, 50, 50 1/2, 51, 51 1/2, 52, 52 1/2, 53, 53 1/2, 54, 54 1/2, 55, 55 1/2, 56, 56 1/2, 57, 57 1/2, 58, 58 1/2, 59, 59 1/2, 60, 60 1/2, 61, 61 1/2, 62, 62 1/2, 63, 63 1/2, 64, 64 1/2, 65, 65 1/2, 66, 66 1/2, 67, 67 1/2, 68, 68 1/2, 69, 69 1/2, 70, 70 1/2, 71, 71 1/2, 72, 72 1/2, 73, 73 1/2, 74, 74 1/2, 75, 75 1/2, 76, 76 1/2, 77, 77 1/2, 78, 78 1/2, 79, 79 1/2, 80, 80 1/2, 81, 81 1/2, 82, 82 1/2, 83, 83 1/2, 84, 84 1/2, 85, 85 1/2, 86, 86 1/2, 87, 87 1/2, 88, 88 1/2, 89, 89 1/2, 90, 90 1/2, 91, 91 1/2, 92, 92 1/2, 93, 93 1/2, 94, 94 1/2, 95, 95 1/2, 96, 96 1/2, 97, 97 1/2, 98, 98 1/2, 99, 99 1/2, 100, 100 1/2, 101, 101 1/2, 102, 102 1/2, 103, 103 1/2, 104, 104 1/2, 105, 105 1/2, 106, 106 1/2, 107, 107 1/2, 108, 108 1/2, 109, 109 1/2, 110, 110 1/2, 111, 111 1/2, 112, 112 1/2, 113, 113 1/2, 114, 114 1/2, 115, 115 1/2, 116, 116 1/2, 117, 117 1/2, 118, 118 1/2, 119, 119 1/2, 120, 120 1/2, 121, 121 1/2, 122, 122 1/2, 123, 123 1/2, 124, 124 1/2, 125, 125 1/2, 126, 126 1/2, 127, 127 1/2, 128, 128 1/2, 129, 129 1/2, 130, 130 1/2, 131, 131 1/2, 132, 132 1/2, 133, 133 1/2, 134, 134 1/2, 135, 135 1/2, 136, 136 1/2, 137, 137 1/2, 138, 138 1/2, 139, 139 1/2, 140, 140 1/2, 141, 141 1/2, 142, 142 1/2, 143, 143 1/2, 144, 144 1/2, 145, 145 1/2, 146, 146 1/2, 147, 147 1/2, 148, 148 1/2, 149, 149 1/2, 150, 150 1/2, 151, 151 1/2, 152, 152 1/2, 153, 153 1/2, 154, 154 1/2, 155, 155 1/2, 156, 156 1/2, 157, 157 1/2, 158, 158 1/2, 159, 159 1/2, 160, 160 1/2, 161, 161 1/2, 162, 162 1/2, 163, 163 1/2, 164, 164 1/2, 165, 165 1/2, 166, 166 1/2, 167, 167 1/2, 168, 168 1/2, 169, 169 1/2, 170, 170 1/2, 171, 171 1/2, 172, 172 1/2, 173, 173 1/2, 174, 174 1/2, 175, 175 1/2, 176, 176 1/2, 177, 177 1/2, 178, 178 1/2, 179, 179 1/2, 180, 180 1/2, 181, 181 1/2, 182, 182 1/2, 183, 183 1/2, 184, 184 1/2, 185, 185 1/2, 186, 186 1/2, 187, 187 1/2, 188, 188 1/2, 189, 189 1/2, 190, 190 1/2, 191, 191 1/2, 192, 192 1/2, 193, 193 1/2, 194, 194 1/2, 195, 195 1/2, 196, 196 1/2, 197, 197 1/2, 198, 198 1/2, 199, 199 1/2, 200, 200 1/2, 201, 201 1/2, 202, 202 1/2, 203, 203 1/2, 204, 204 1/2, 205, 205 1/2, 206, 206 1/2, 207, 207 1/2, 208, 208 1/2, 209, 209 1/2, 210, 210 1/2, 211, 211 1/2, 212, 212 1/2, 213, 213 1/2, 214, 214 1/2, 215, 215 1/2, 216, 216 1/2, 217, 217 1/2, 218, 218 1/2, 219, 219 1/2, 220, 220 1/2, 221, 221 1/2, 222, 222 1/2, 223, 223 1/2, 224, 224 1/2, 225, 225 1/2, 226, 226 1/2, 227, 227 1/2, 228, 228 1/2, 229, 229 1/2, 230, 230 1/2, 231, 231 1/2, 232, 232 1/2, 233, 233 1/2, 234, 234 1/2, 235, 235 1/2, 236, 236 1/2, 237, 237 1/2, 238, 238 1/2, 239, 239 1/2, 240, 240 1/2, 241, 241 1/2, 242, 242 1/2, 243, 243 1/2, 244, 244 1/2, 245, 245 1/2, 246, 246 1/2, 247, 247 1/2, 248, 248 1/2, 249, 249 1/2, 250, 250 1/2, 251, 251 1/2, 252, 252 1/2, 253, 253 1/2, 254, 254 1/2, 255, 255 1/2, 256, 256 1/2, 257, 257 1/2, 258, 258 1/2, 259, 259 1/2, 260, 260 1/2, 261, 261 1/2, 262, 262 1/2, 263, 263 1/2, 264, 264 1/2, 265, 265 1/2, 266, 266 1/2, 267, 267 1/2, 268, 268 1/2, 269, 269 1/2, 270, 270 1/2, 271, 271 1/2, 272, 272 1/2, 273, 273 1/2, 274, 274 1/2, 275, 275 1/2, 276, 276 1/2, 277, 277 1/2, 278, 278 1/2, 279, 279 1/2, 280, 280 1/2, 281, 281 1/2, 282, 282 1/2, 283, 283 1/2, 284, 284 1/2, 285, 285 1/2, 286, 286 1/2, 287, 287 1/2, 288, 288 1/2, 289, 289 1/2, 290, 290 1/2, 291, 291 1/2, 292, 292 1/2, 293, 293 1/2, 294, 294 1/2, 295, 295 1/2, 296, 296 1/2, 297, 297 1/2, 298, 298 1/2, 299, 299 1/2, 300, 300 1/2, 301, 301 1/2, 302, 302 1/2, 303, 303 1/2, 304, 304 1/2, 305, 305 1/2, 306, 306 1/2, 307, 307 1/2, 308, 308 1/2, 309, 309 1/2, 310, 310 1/2, 311, 311 1/2, 312, 312 1/2, 313, 313 1/2, 314, 314 1/2, 315, 315 1/2, 316, 316 1/2, 317, 317 1/2, 318, 318 1/2, 319, 319 1/2, 320, 320 1/2, 321, 321 1/2, 322, 322 1/2, 323, 323 1/2, 324, 324 1/2, 325, 325 1/2, 326, 326 1/2, 327, 327 1/2, 328, 328 1/2, 329, 329 1/2, 330, 330 1/2, 331, 331 1/2, 332, 332 1/2, 333, 333 1/2, 334, 334 1/2, 335, 335 1/2, 336, 336 1/2, 337, 337 1/2, 338, 338 1/2, 339, 339 1/2, 340, 340 1/2, 341, 341 1/2, 342, 342 1/2, 343, 343 1/2, 344, 344 1/2, 345, 345 1/2, 346, 346 1/2, 347, 347 1/2, 348, 348 1/2, 349, 349 1/2, 350, 350 1/2, 351, 351 1/2, 352, 352 1/2, 353, 353 1/2, 354, 354 1/2, 355, 355 1/2, 356, 356 1/2, 357, 357 1/2, 358, 358 1/2, 359, 359 1/2, 360, 360 1/2, 361, 361 1/2, 362, 362 1/2, 363, 363 1/2, 364, 364 1/2, 365, 365 1/2, 366, 366 1/2, 367, 367 1/2, 368, 368 1/2, 369, 369 1/2, 370, 370 1/2, 371, 371 1/2, 372, 372 1/2, 373, 373 1/2, 374, 374 1/2, 375, 375 1/2, 376, 376 1/2, 377, 377 1/2, 378, 378 1/2, 379, 379 1/2, 380, 380 1/2, 381, 381 1/2, 382, 382 1/2, 383, 383 1/2, 384, 384 1/2, 385, 385 1/2, 386, 386 1/2, 387, 387 1/2, 388, 388 1/2, 389, 389 1/2, 390, 390 1/2, 391, 391 1/2, 392, 392 1/2, 393, 393 1/2, 394, 394 1/2, 395, 395 1/2, 396, 396 1/2, 397, 397 1/2, 398, 398 1/2, 399, 399 1/2, 400, 400 1/2, 401, 401 1/2, 402, 402 1/2, 403, 403 1/2, 404, 404 1/2, 405, 405 1/2, 406, 406 1/2, 407, 407 1/2, 408, 408 1/2, 409, 409 1/2, 410, 410 1/2, 411, 411 1/2, 412, 412 1/2, 413, 413 1/2, 414, 414 1/2, 415, 415 1/2, 416, 416 1/2, 417, 417 1/2, 418, 418 1/2, 419, 419 1/2, 420, 420 1/2, 421, 421 1/2, 422, 422 1/2, 423, 423 1/2, 424, 424 1/2, 425, 425 1/2, 426, 426 1/2, 427, 427 1/2, 428, 428 1/2, 429, 429 1/2, 430, 430 1/2, 431, 431 1/2, 432, 432 1/2, 433, 433 1/2, 434, 434 1/2, 435, 435 1/2, 436, 436 1/2, 437, 437 1/2, 438, 438 1/2, 439, 439 1/2, 440, 440 1/2, 441, 441 1/2, 442, 442 1/2, 443, 443 1/2, 444, 444 1/2, 445, 445 1/2, 446, 446 1/2, 447, 447 1/2, 448, 448 1/2, 449, 449 1/2, 450, 450 1/2, 451, 451 1/2, 452, 452 1/2, 453, 453 1/2, 454, 454 1/2, 455, 455 1/2, 456, 456 1/2, 457, 457 1/2, 458, 458 1/2, 459, 459 1/2, 460, 460 1/2, 461, 461 1/2, 462, 462 1/2, 463, 463 1/2, 464, 464 1/2, 465, 465 1/2, 466, 466 1/2, 467, 467 1/2, 468, 468 1/2, 469, 469 1/2, 470, 470 1/2, 471, 471 1/2, 472, 472 1/2, 473, 473 1/2, 474, 474 1/2, 475, 475 1/2, 476, 476 1/2, 477, 477 1/2, 478, 478 1/2, 479, 479 1/2, 480, 480 1/2, 481, 481 1/2, 482, 482 1/2, 483, 483 1/2, 484, 484 1/2, 485, 485 1/2, 486, 486 1/2, 487, 487 1/2, 488, 488 1/2, 489, 489 1/2, 490, 490 1/2, 491, 491 1/2, 492, 492 1/2, 493, 493 1/2, 494, 494 1/2, 495, 495 1/2, 496, 496 1/2, 497, 497 1/2, 498, 498 1/2, 499, 499 1/2, 500, 500 1/2, 501, 501 1/2, 502, 502 1/2, 503, 503 1/2, 504, 504 1/2, 505, 505 1/2, 506, 506 1/2, 507, 507 1/2, 508, 508 1/2, 509, 509 1/2, 510, 510 1/2, 511, 511 1/2, 512, 512 1/2, 513, 513 1/2, 514, 514 1/2, 515, 515 1/2, 516, 516 1/2, 517, 517 1/2, 518, 518 1/2, 519, 519 1/2, 520, 520 1/2, 521, 521 1/2, 522, 522 1/2, 523, 523 1/2, 524, 524 1/2, 525, 525 1/2, 526, 526 1/2, 527, 527 1/2, 528, 528 1/2, 529, 529 1/2, 530, 530 1/2, 531, 531 1/2, 532, 532 1/2, 533, 533 1/2, 534, 534 1/2, 535, 535 1/2, 536, 536 1/2, 537, 537 1/2, 538, 538 1/2, 539, 539 1/2, 540, 540 1/2, 541, 541 1/2, 542, 542 1/2, 543, 543 1/2, 544, 544 1/2, 545, 545 1/2, 546, 546 1/2, 547, 547 1/2, 548, 548 1/2, 549, 549 1/2, 550, 550 1/2, 551, 551 1/2, 552, 552 1/2, 553, 553 1/2, 554, 554 1/2, 555, 555 1/2, 556, 556 1/2, 557, 557 1/2, 558, 558 1/2, 559, 559 1/2, 560, 560 1/2, 561, 561 1/2, 562, 562 1/2, 563, 563 1/2, 564, 564 1/2, 565, 565 1/2, 566, 566 1/2, 567, 567 1/2, 568, 568 1/2, 569, 569 1/2, 570, 570 1/2, 571, 571 1/2, 572, 572 1/2, 573, 573 1/2, 574, 574 1/2, 575, 575 1/2, 576, 576 1/2, 577, 577 1/2, 578, 578 1/2, 579, 579 1/2, 580, 580 1/2, 581, 581 1/2, 582, 582 1/2, 583, 583 1/2, 584, 584 1/2, 585, 585 1/2, 586, 586 1/2, 587, 587 1/2, 588, 588 1/2, 589, 589 1/2, 590, 590 1/2, 591, 591 1/2, 592, 592 1/2, 593, 593 1/2, 594, 594 1/2, 595, 595 1/2, 596, 596 1/2, 597, 597 1/2, 598, 598 1/2, 599, 599 1/2, 600, 600 1/2, 601, 601 1/2, 602, 602 1/2, 603, 603 1/2, 604, 604 1/2, 605, 605 1/2, 606, 606 1/2, 607, 607 1/2, 608, 608 1/2, 609, 609 1/2, 610, 610 1/2, 611, 611 1/2, 612, 612 1/2, 613, 613 1/2, 614, 614 1/2, 615, 615 1/2, 616, 616 1/2, 617, 617 1/2, 618, 618 1/2, 619, 619 1/2, 620, 620 1/2, 621, 621 1/2, 622, 622 1/2, 623, 623 1/2, 624, 624 1/2, 625, 625 1/2, 626, 626 1/2, 627, 627 1/2, 628, 628 1/2, 629, 629 1/2, 630, 630 1/2, 631, 631 1/2, 632, 632 1/2, 633, 633 1/2, 634, 634 1/2, 635, 635 1/2, 636, 636 1/2, 637, 637 1/2, 638, 638 1/2, 639, 639 1/2, 640, 640 1/2, 641, 641 1/2, 642, 642 1/2, 643, 643 1/2, 644, 644 1/2, 645, 645 1/2, 646, 646 1/2, 647, 647 1/2, 648, 648 1/2, 649, 649 1/2, 650, 650 1/2, 651, 651 1/2, 652, 652 1/2, 653, 653 1/2, 654, 654 1/2, 655, 655 1/2, 656, 656 1/2, 657, 657 1/2, 658, 658 1/2, 659, 659 1/2, 660, 660 1/2, 661, 661 1/2, 662, 662 1/2, 663, 663 1/2, 664, 664 1/2, 665, 665 1/2, 666, 666 1/2, 667, 667 1/2, 668, 668 1/2, 669, 669 1/2, 670, 670 1/2, 671, 671 1/2, 672, 672 1/2, 673, 673 1/2, 674, 674 1/2, 675, 675 1/2, 676, 676 1/2, 677, 677 1/2, 678, 678 1/2, 679, 679 1/2, 680, 680 1/2, 681, 681 1/2, 682, 682 1/2, 683, 683 1/2, 684, 684 1/2, 685, 685 1/2, 686, 686 1/2, 687, 687 1/2, 688, 688 1/2, 689, 689 1/2, 690, 690 1/2, 691, 691 1/2, 692, 692 1/2, 693, 693 1/2, 694, 694 1/2, 695, 695 1/2, 696, 696 1/2, 697, 697 1/2, 698, 698 1/2, 699, 699 1/2, 700, 700 1/2, 701, 701 1/2, 702, 702 1/2, 703, 703 1/2, 704, 704 1/2, 705, 705 1/2, 706, 706 1/2, 707, 707 1/2, 708, 708 1/2, 709, 709 1/2, 710, 710 1/2, 711, 711 1/2, 712, 712 1/2, 713, 713 1/2, 714, 714 1/2, 715, 715 1/2, 716, 716 1/2, 717, 717 1/2, 718, 718 1/2, 719, 719 1/2, 720, 720 1/2, 721, 721 1/2, 722, 722 1/2, 723, 723 1/2, 724, 724 1/2, 725, 725 1/2, 726, 726 1/2, 727, 727 1/2, 728, 728 1/2, 729, 729 1/2, 730, 730 1/2, 731, 731 1/2, 732, 732 1/2, 733, 733 1/2, 734, 734 1/2, 735, 735 1/2, 736, 736 1/2, 737, 737 1/2, 738, 738 1/2, 739, 739 1/2, 740, 740 1/2, 741, 741 1/2, 742, 742 1/2, 743, 743 1/2, 744, 744 1/2, 745, 745 1/2, 746, 746 1/2, 747, 747 1/2, 748, 748 1/2, 749, 749 1/2, 750, 750 1/2, 751, 751 1/2, 752, 752 1/2, 753, 753 1/2, 754, 754 1/2, 755, 755 1/2, 756, 756 1/2, 757, 757 1/2, 758, 758 1/2, 759, 759 1/2, 760, 760 1/2, 761, 761 1/2, 762, 762 1/2, 763, 763 1/2, 764, 764 1/2, 765, 765 1/2, 766, 766 1/2, 767, 767

GEO. K. OYLER MFG. CO.,

ST. LOUIS, MO.,

MANUFACTURE ALL KINDS OF



CASTER AND ADJUSTABLE ROLLING COLTERS

FOR WOOD OR STEEL BEAM PLOWS.

WRITE FOR PRICE LIST.

FRUIT, WINE & JELLY PRESS
SAUSAGE STUFFER
MOLASSES
SELF MEASURING FAUCET
ENTERPRISE MFG. CO.
THIRD & DAUPHIN STS.
PA
SELF WEIGHING CHEESE KNIFE
COLD HANDLE SAD IRONS
SOLE BY ALL HARDWARE DEALERS
SEND FOR ILLUSTRATED CATALOGUE
Nº20 COFFEE MILL
SMOKED
BEEF SHAVER
MEAT CHOPPER
BUNG HOLE BORER
TOBACCO
& ROOT CUTTER

PEUGEOT FRÈRES,

MANUFACTURERS OF

Finest Grades of Steel

FOR WATCH, CLOCK AND OTHER SPRINGS,
Band Steel for Saws for Metal and Wood. Steel for all Mechanical Uses. The
"Lion" Brand of Band Saws Best and Cheapest Made.
Correspondence Solicited.

McCOY & SANDERS,

AGENTS FOR UNITED STATES AND CANADA

26 WARREN STREET, NEW YORK.



J. E. REDFIELD,

MANUFACTURER OF

TAPS, REAMERS, SCREW PLATES, &c.

ESSEX, CONN.

Our Taps are all Machine Relieved, and we guarantee them to give satisfaction.

THE CINCINNATI CORRUGATING CO.,
CINCINNATI, OHIO.
MANUFACTURERS OF
CORRUGATED SHEET IRON.
Superior Corrugated
Roofing, Siding, Cell-
ing, Arches, Lat-
etc.
or Rolling
Mills, Blast Furnaces,
Foundries, Machine
Shops, Car Shops, Boiler
and Engine Rooms, Etc.
Fire, Water and Wind Proof. Light, Cheap and Durable.
Send for Descriptive Illustrated Catalogue.

"MORTON'S METAL"

(Registered Trade-Mark, May 1st, 1883.)



CHAMPION CHAIN.

CABLE AND CHAMPION SASH-CHAINS

AND
PATENTED ATTACHMENTS.

The most RELIABLE and CHEAPEST article in the market for sus-
pending WINDOW SASHES. Has Great Tensile Strength, can
be easily applied to any window, and gives SATISFACTION wherever used.
Liberal Discount to the Trade. Now in use in all the leading
cities throughout the United States. Have just furnished Chains to the
following buildings: Mutual Life Insurance Co., Hoffman House,
Williamsburg Fire Insurance Co. and the Navaro Flat.

Samples Sent to Any Hardware House Free on Application.

MANUFACTURED ONLY BY

THOMAS MORTON,

65 ELIZABETH ST., NEW YORK.

B. KREISCHER & SONS, FIRE BRICK.

BEST AND CHEAPEST.

Established 1845.

Office, foot of Houston Street, East River,
NEW YORK.

NEWTON & CO.,

ALBANY, N. Y.,

MANUFACTURERS OF BEST QUALITY

FIRE BRICK

AND

STOVE LININGS.

M. D. VALENTINE & BRO.,

MANUFACTURERS OF

FIRE BRICK

And Furnace Blocks.

DRAIN PIPE AND LAND TILE,

Woodbridge, - - N. J.

BORGNER & O'BRIEN,

MANUFACTURERS

FIRE BRICK

AND

Edge Pressed Furnace Blocks,

CLAY RETORTS, TILES, &c.,

Twenty-third Street,

Above Race, PHILADELPHIA.

Twenty years' practical Experience.

WOODBRIDGE CLAY MINING & REFIN'G CO.

ADDRESS: FACTORY AT
Woodbridge, N. J. Spa Spring Station, P. R. R. N. J.

MANUFACTURERS OF

FIRE BRICK.

S. G. PHILLIPS, Pres., WM. H. LIVINGOOD, Sec. & Treas.,
Woodbridge, N. J. Reading, Pa.

WATSON FIRE BRICK CO.,

Established 1836.

Successors to JOHN R. WATSON, Perth Amboy, New Jersey,
Manufacturers of

FIRE BRICK,

FOR ROLLING MILLS, BLAST FURNACES, FOUN-
DRIES, GAS WORKS, LIME KILNS, TANNERIES,
BOILER AND GRATE SETTING, GLASS WORKS, &c
Fire Clays, Fire Sand and Kaolin for Sale.

ESTABLISHED 1848.

TROY FIRE BRICK WORKS,

Troy, N. Y.

James Ostrander & Son,

FIRE BRICK,

Tiles, Blast Furnace Blocks, &c., and in a Special
Department Linings for Stoves, Ranges and Heaters of
superior quality. Miners of and dealers in Wood-
bridge, N. J. Fire Clay and Fire Sand and Station
Island Kaolin.

ESTABLISHED 1864.

JAMES GARDNER,

Successor to GARDNER BROS.,

MANUFACTURERS OF

"STANDARD SAVAGE" FIRE BRICK, TILE & FURNACE BLOCKS,

OF ALL SHAPES AND SIZES

Miner and Shipper of "Mount Savage" Fire Clay.

WORKS, Eilersie, Allegheny Co., Md.

MAIN OFFICE, Cumberland, Md., P. O. Box 93.

BRANCH OFFICE, Pittsburgh, Pa., P. O. Box 373.

S. H. Hamilton & Co., Agents, Baltimore, Md.

UNION MINING COMPANY.

Mount Savage Fire Brick.

EDWARD J. ETTING, Agent,

222 South Third St., Philadelphia, Pa.

EXCELSIOR AND ECLIPSE

LAWN MOWERS HAND MOWERS

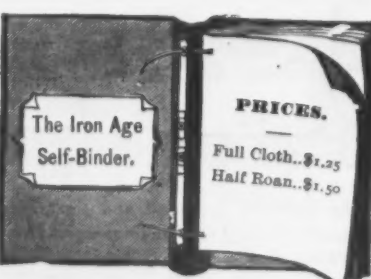
GUARANTEED
BEST & CHEAPEST
10 TO 20 IN.
LARGE REDUCTION
IN PRICE

HORSE MOWERS

25 TO 40 IN.
CHADBORN &
COLDWELL
MANUF'G CO.
NEWBURGH, N. Y.

Send for Circular
and Price-List.

Self-Binders' for The Iron Age.



We are now prepared to supply our sub-
scribers with an excellent self-binder for
their papers, a cut of which is annexed.
We call attention to the low prices at which
it is offered. Address all orders to
DAVID WILLIAMS,
53 Reade Street, New York.

NEW ENGLAND BUTT COMPANY,

MANUFACTURERS OF

Drilled Cast Butt Hinges,

AND

"CHINESE" LAUNDRY IRONS, SAD IRONS, &c.



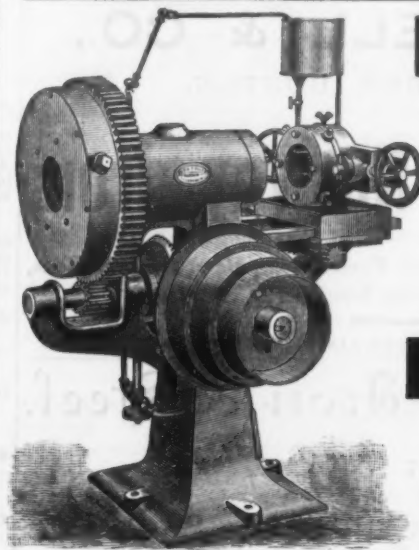
"Chinese" Laundry Irons.

These "Chinese" Laundry Irons are of
superior quality, made from the best pig
iron, highly finished, and rounded on
edges, having Wrought-Iron Handles, with
neatly molded Tops of Cast Iron.

The Three Sizes, Nos. 1, 2 and 3,
correspond in weight with 4, 5 and
7 lb. Sad Irons.

NEW YORK OFFICE:
99 Chambers St.

Factories: PROVIDENCE, R. I.



Don't You?

Have sufficient Pipe-Work
about your Mill, Factory
or Shops to make a Power-
ful, Convenient, and very
Compact

Pipe-Cutting Machine

Soon pay for itself?

Don't You?

Further think it might pay
you to write us for particu-
lars of the "ECLIPSE"
MACHINES, for which we
claim many desirable fea-
tures, including Moderate

Prices. We build the "Eclipse" for both Hand and Power
use. Mention this Paper and address,

PANCOAST & MAULE,
PHILADELPHIA, PA.

LANE'S PATENT DOOR HANGER.

THE MOST PERFECT ANTI-FRICTION HANGER IN THE MARKET, BECAUSE

It is made entirely of Wrought Iron, except the Wheel, which has a Steel Axle.



It will not break.
It is practically free from wear.
It is almost noiseless in action.
It requires no oil.
It has a broad bearing on the door, and keeps in
line.
It is by far the most durable.
It may be used with any track.
It is always in order.

LANE'S PATENT TRACK

is made of flat wrought iron and is easily put in
position.
Catches and holds no snow or ice.
Door hung thereon cannot jump the track.
Is not subject to
decay.
Requires no fit-
ting, but is
ready at once.

MANUFACTURED BY

LANE

BROS.,

POUGHKEEPSIE

N. Y.

Showing Track.

JOHN H. GRAHAM & CO., General Agents, 113 Chambers Street, NEW YORK.

The F. F. ADAMS COMPANY, Erie, Pa.

THE LATEST THING OUT.

IDEAL MOUSE TRAP.

So perfectly simple in construction there is
nothing to get out of order, as is the case with all
other traps made on this principle. Guaranteed
to give perfect satisfaction. Send for sample
gross and you will not have any other trap that
catches mice alive. The inventor of the Ideal in-
vented all of the leading traps in the market to-
day, and he says this one is perfection. Great
care is taken in the manufacture of the Ideal, and
every trap is perfect. A single trap for inspec-
tion will be sent by mail upon receipt of 25c. in
stamps.

The Cyclone Mouse Trap.

We invite the attention of dealers to this "Novelty" in Mouse Traps.

Patented Nov. 5, 1884, and now

having an immense sale. It is

cheap, durable and attractive, and

so sensitive that the mouse who

ventures to but touch his nose to

the bait box is doomed. Our sales-

men on the road say it is the most

popular trap ever offered to the

trade. One of our men in a single

short trip sold 5000. The retail

price is only 10 cents each, and yet they afford big profits to the dealer. We will send a sample by mail for

inspection, upon receipt of five 3-cent stamps. Send for our Illustrated Catalogue.



THE CELEBRATED

Pieper Breech-Loading Guns.

SOLE AGENTS,

Schoverling, Daly & Gales,

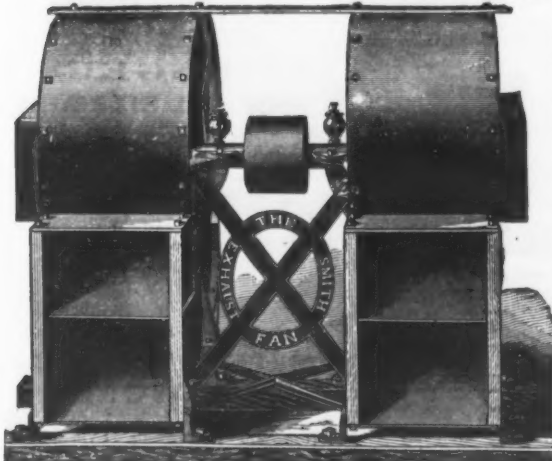
84 & 86 CHAMBERS STREET, NEW YORK.

WHOLESALE ONLY.

SEND FOR CATALOGUE

Smith Exhaust Fan, Forge and Pressure Blowers.

SAVE 50 PER CENT. POWER. MOST COMPACT. CHEAP.



Double Exhauster—Front, showing 4 Patented Discharge Openings, where others have only 2.

The Fans are specially adapted for removing dust from Emery and other Polishing Wheels, Grindstones and Cleaning Mills; Smoke and Gas from Machine Shops, Steam from Dyeing Establishments, Ventilating Buildings, Tunnels and Mines; Removing Bark and Dust from Mills in Tanneries; Shavings and Dust from Planing Mill Machinery and other Wood Working Establishments.

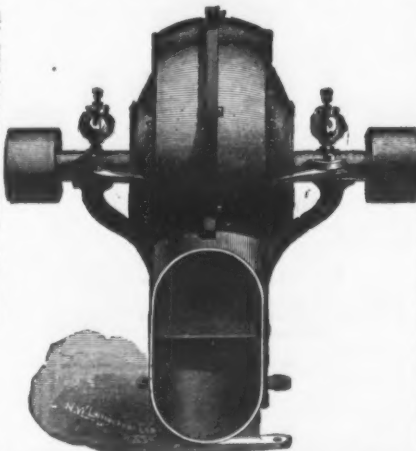
Cupola and Pressure Blowers are especially adapted to Cupola Furnaces and Forges, and all places where a strong blast is required.

Every machine tested before shipping, and fully warranted.

**HUYETT & SMITH
MFG. CO.,**

No. 1400 Russell St.,
DETROIT, MICHIGAN.

Send for Catalogue and Prices.



Front View, showing 2 Patented Discharge Openings, where others have only 1.

FOX'S CORRUGATED BOILER FURNACES.

1. They are made of a single steel plate, welded at the bottom, with no joint in contact with the flame.
2. They give 50 per cent. more evaporative power.
3. They throw off all scale by their elasticity.
4. They do not destroy themselves by the variation of temperature, contracting and expanding as they do like an accordion. They have not enough stiffness to work against the boiler heads.
5. They require, to comply with the rules of the Board of Trade in England, only one-half the thickness of plate of plain furnaces for equal working pressure.
6. Where a plain furnace of equal length, diameter and thickness collapsed at 25 pounds, the Corrugated stood 1000 pounds per square inch.

Since five years 700 steamers were fitted with these furnaces, among them the Alaska, Oregon, City of Rome, Servia, Elbe, Werma, Fulda, &c.

Perfect safety and greatest economy combined.

For particulars, apply to

Hartmann, Le Doux & Maccker,

184 Pearl St., NEW YORK,

Sole Agents and Assignees of U. S. Patents.

The Scientific Portable Forges

HAND AND POWER BLOWERS,
Exhaust Fans, &c.

NEW IN PRINCIPLE,
SUPERIOR IN CONSTRUCTION,
EXCELLED BY NONE.

Made in different styles and sizes for all kinds of work. Examine the "SCIENTIFIC" before you buy. Illustrated Catalogue furnished by

FAIRBANKS & CO.

311 Broadway, New York,

GENERAL EASTERN AGENTS.

THE FOOS MANUFACTURING CO.,

Springfield, Ohio.

FOR SALE BY THE TRADE.

PRATT'S

**Straightway Swinging Stop and
Check Valves.**

The only Straightway
Valve that can be ground
in without being disconnected
from Pipes.

FAIRBANKS & CO.,

SOLE AGENTS,

311 Broadway, New York.

THE HANCOCK INSPIRATOR

The Standard for Stationary, Marine, Locomotive

AND ALL CLASSES OF BOILERS.

Over 60,000 in Use.

Adopted by the Largest Mills and Manufacturers.

SEND FOR CIRCULARS TO

FAIRBANKS & CO.,

311 Broadway, NEW YORK.

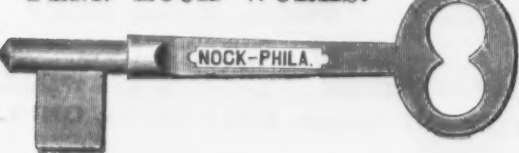


It is a perfect
little beauty.
The lightest running,
best and cheapest Lawn
Mower in the Market.
No experiment.
Great reduction in price.
10, 12, 14 and 16 inch cut.

Also Manufacture of the
Buckeye Hose Reel and Lawn
Sprinkler, Buckeye Wrought
Iron Fencing, Buckeye
Force Pump,
AND
Iron Turbine Wind Engines.

Send for Circular and Price List.

PENN LOCK WORKS.



NICKEL-PLATED

Steel Key Blanks

OF EVERY DESCRIPTION.

G. W. NOCK,

142 N. Fourth Street,
PHILADELPHIA, PA.

Thos. A. Edison, President.

Chas. Batchelor, Treasurer.

H. M. Livor, G'l Mgr.

Edison Shafting Mfg. Co.

MANUFACTURERS OF

TURNED STEEL & IRON

SHAFTING,

Couplings, Hangers, Pulleys, &c.

Also Agents for the Sale of Cold-Rolled
Steel Shafting made by Gautier Steel
Dept. of Cambria Iron Co.

Works at 86, 88 and 90 Goerck St., New York,
TELEPHONE, 744 SPRING.

Office at 191 Fulton Street, New York,
TELEPHONE, 438 JOHN.

PATENTED ARTICLES

MALLEABLE IRON.

Hammer's Adjustable Clamps.



Hammer's Malleable Iron Oilers, 3 Sizes.

Hammer's Mail Iron Hand Lamps.

Hammer's M. I. Hanging Lamps

pattern Heavy Screw Clamps;

strongest in the market.

For sale by all the principal Hardware dealers.

Send for Price List.

Malleable Iron Castings

Of superior quality and Hardware Specialties in

Malleable Iron made to order.

HAMMER & CO.,

BRANFORD, CONN.

AGENTS IN ALL FOREIGN COUNTRIES.



119 South Fourth Street,

PHILADELPHIA

Branch Office, 605 Seventh St. Washington, D.C.

M. HOWSON, Engineer and Builder of Patents.

G. HOWSON, Attorney at Law and Counsel in Patent Cases.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

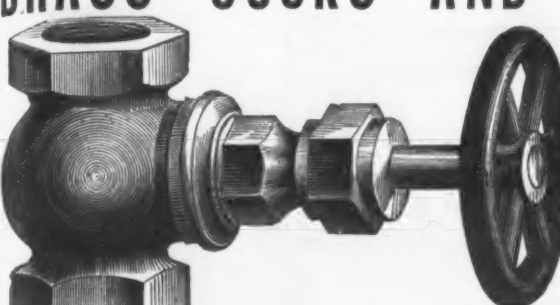
SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

SEND FOR CIRCULARS.

McNab & Harlin Mfr. Co.,
MANUFACTURERS OF
BRASS COCKS AND VALVES,
For STEAM, WATER, and GAS.
Wrought Iron Pipe and Fittings,
PLUMBERS' MATERIALS.
Factory, Paterson, N. J. 56 John Street, N. Y.
Our new Illustrated Catalogue and Price List is now ready, and will be sent to the trade with their first order, or by express, if desired, before ordering.



RIVETS
OF EVERY DESCRIPTION, FIRST QUALITY
W.P. TOWNSEND & CO.
NEW BRIGHTON, PA.
COUNTERSUNK HEAD, ROUND HEAD, FLAT HEAD, STEEP HEAD, CONE HEAD, ROSE HEAD, TRUSS HEAD, MOUNT BOX HEAD, MOUNT RIVET.



WM. H. HASKELL, President. E. S. MARON, Treasurer. D. A. HUNT, Agent.
WM. H. HASKELL CO.,
MANUFACTURERS OF
GIMLET POINT
COACH SCREWS



Bolts, Cold-Punched Nuts & Washers,
SUITABLE FOR MACHINERY OF ALL KINDS.
Office and Works: 277 Main St., PAWTUCKET, R. I., U. S. A.
HENRY B. NEWHALL CO., Agents,
105 Chambers St., New York. 47 Pearl St., Boston.

Philadelphia "STAR" Bolt Works.
NORWAY IRON FANCY HEAD BOLTS.
Carriage & Tire Bolts, Star Axle Clips, &c.
TOWNSEND, WILSON & HUBBARD, 2301 Cherry St., Philadelphia, Pa.



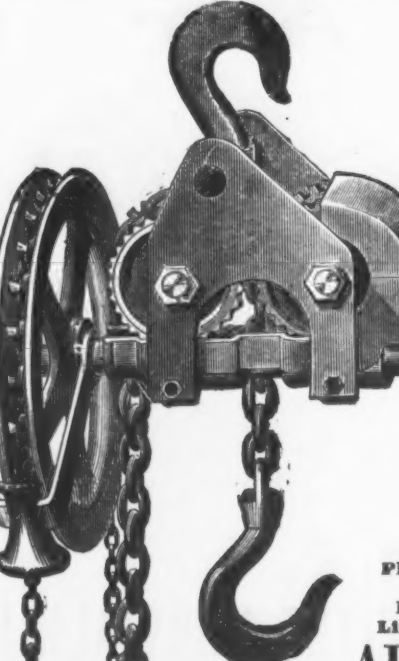
WM. McILVAIN & SONS,
MANUFACTURERS OF
BOILER PLATE
AND
CHARCOAL BLOOMS.
Locomotive, Fire Box, Flange and Shell Iron; Plate for Bridges and Girders; Tank and Stack Iron; Boat Plate and Iron for Wrought Pipe; Plate Iron for Fire and Burglar-Proof Safes.
TENSILE STRAIN: 56,000 to 64,000 lbs.
REDUCTION OF AREA—35 to 43 per cent.
CAPACITY: Plates 1 1/4 inch thick to No. 14. 30 feet long. 70 inches wide.



RIEHLÉ BROS.
STANDARD
SCALES
AND
TESTING MACHINES
Railroad and Warehouse Trucks of all sizes and descriptions.



BARNES' PATENT SPIRAL SLEEVE FRICTION CLUTCH PULLEYS
AND
CUT-OFF COUPLINGS.
Best and Cheapest in the Market.
H. N. BATES & CO.
Manufacturers,
No. 858 Atlantic Avenue,
BOSTON, MASS.
Send for Catalogue.

BOX'S PATENT RADIAL DRILLS.
Box's Patent Double-Screw Hoists.
12,000 Hoists sold. Orders continually renewed prove conclusively their superiority above all others. A liberal discount to the trade.
Elevators, Cranes, Radial Drills
—AND—
SPECIAL HOISTING MACHINERY.
Send for 1884 Illustrated Circular.
Philadelphia Office, 314 Green Street.
New York, 91 Liberty Street.
Boston, 1176 Tremont Street, and
Liverpool, England, No. 1 Hall Lane.
ALFRED BOX & CO.



BEAUDRY'S UPRIGHT POWER HAMMER.
SIMPLE, PRACTICAL AND LOW-PRICED.
This Hammer is of an entirely new design and adapted to all kinds of work.
It strikes a direct upright blow, which is given with the same elasticity as by a blacksmith's arm, and thus does not chill the work.
BEAUDRY & CUNNINGHAM,
Office, Mason Building, 150 Portland Street, BOSTON, MASS.
For full Description and Testimonials, Send for Circular.
Address P. O. Box 1218.

J. H. WILLIAMS & CO.
COR. RICHARDS & BOWNE STS.
(NEAR HAMILTON FERRY) BROOKLYN, N. Y.
IRON AND STEEL
DROP W FORGINGS
OF THE BEST QUALITY
NEW BUILDINGS AND MACHINERY ESPECIALLY ADAPTED FOR THE BUSINESS. ESTIMATES GIVEN ON RECEIPT OF MODELS

THE ATTENTION OF THE **HARDWARE** and **TOOL TRADE** IS CALLED TO OUR
Folding and Adjustable Handle
DRAW KNIFE.
It is made of the best Tool Steel. It will keep an edge longer than any other Knife. It will pack easily, and never dull from contact with other tools. It is new, novel, and selling rapidly.
A. J. WILKINSON & CO.,
184-188 Washington St., BOSTON, MASS.,
SOLE MANUFACTURERS.
Send for Circular and Price List.



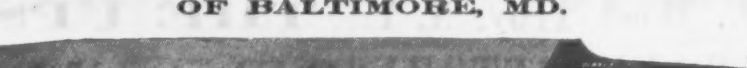
Hall's Pat. Jetometer
New Double Lift and Force Steam Pump
UP TO 80 FEET.
WORKS with 40 per cent. less Steam than any other Jet Pump.
INVALUABLE for all Water-Raising purposes.
NO Moving Parts, Oil, Grease or Attention.
THOROUGHLY Reliable under all conditions.
EXTREMELY Simple; High-Class Materials, and Low in Price.
SEND FOR PARTICULARS.
FIRST-CLASS AGENTS WANTED.



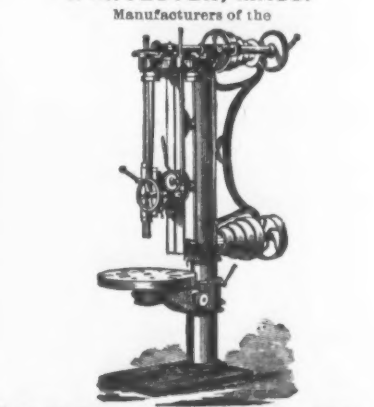
HALL'S ENGINEERING CO., 112 John St., New York.
THE NEW GIANT DRILL CHUCK.
Holds a Drill With the Grip of a Giant. All Steel.
Parts Interchangeable.
SIMPLE IN CONSTRUCTION.
EASY TO TAKE APART AND CLEAN. BEST OF WORKMANSHIP AND VERY CHEAP. Manufactured and sold by
THE SMITH & EGGE MFG. CO., Bridgeport, Ct.



UNION FILE WORKS, OF BALTIMORE, MD.
In offering these Files to the trade we guarantee to give satisfaction, each File being thoroughly examined at every stage of manufacture and tested by an expert before leaving the Works.
FLAGLER, FORSYTH & BRADLEY, Agents, 298 Broadway, New York.



P. BLAISDELL & CO.,
WORCESTER, MASS.
Manufacturers of the
"BLAISDELL" UPRIGHT DRILLS
And other First-Class Machinists' Tools.



H.W. JOHNS' ASBESTOS
LIQUID PAINTS,
ROOFING,
FIRE-PROOF BUILDING FELT,
Steam Pipe and Boiler Coverings, Steam Packings,
Mill Board, Gaskets, Sheathings, Fire-Proof Coatings, Cements, &c.
DESCRIPTIVE PRICE LIST AND SAMPLES FREE.
H. W. JOHNS MFG. CO.,
57 Maiden Lane, New York.

A. F. PIKE MFG. CO.,
Pike Station, New Hampshire, U. S. A.
Cable Address, "Pike, Haverhill."
MANUFACTURERS AND WHOLESALE DEALERS IN
BLUE STONE.
The Largest Manufacturers and Dealers in Stones for Sharpening all Edge Tools.
Pike's celebrated Blue Stone, Indian Pond (Red End), Lamoille, Black Diamond, Maple, Green Mountain. All kinds blended with our name are genuine.
Also, Oil, Water and Dry Whetstones; Arkansas, Washita, Turkey, Hindostan and Sandstone Razor Hones, Vienna Cigar-shape.
In fact, everything that is used for sharpening Edge Tools supplied in any grit or shape required. Quality and Prices guaranteed. Send in your orders.



HOLT'S FORGES.
FIVE SIZES,
FOR ALL KINDS OF WORK.
\$10 and Upward.
Send for circulars.
HOLT MFG. CO.,
Cleveland, Ohio.



JOHN ADT & SON,
—BUILDERS OF—
HARDWARE MANUFACTURING MACHINERY.
Send for Catalogue.
NEW HAVEN, CONN., U. S. A.

HOWARD IRON WORKS,
BUFFALO, N. Y.,
Manufacturers of

BENCH VISES,
Price Lists sent on application.
TUCK MFG CO. Brockton, Mass.
Springs Tools & Cutlery.
Tempered Springs of all kinds.
Send for Catalogue.



ENGRAVING DIRECT FROM PHOTOGRAPH.
NO DRAWING REQUIRED.
NO HAND WORK NECESSARY.
SEND (CHEAP, ARTISTIC) FOR PARTICULARS.
FOR CROSSCUP & WEST ENG. CO.
702 CHESTNUT ST. PHILA. PA.

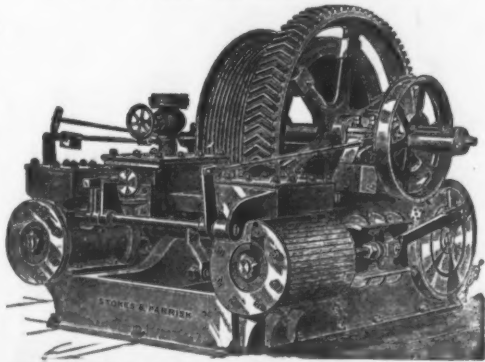
PITTSBURGH MFG. CO.,
Manufacturers of Rail and Spike Machines, Belts, Bells, Washers, Rivets, &c. Castings, Forgings and Blacksmith Work promptly attended to.
Office and Works Railroad St., near 28th, Pittsburgh, Pa.



STOKES & PARRISH, PHILADELPHIA.

ELEVATORS,

Passenger and Freight, Steam, Hydraulic and Belt Power.



HOISTING MACHINERY

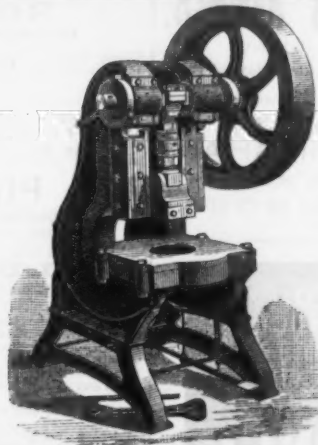
For Mines, Dock Use and Inclined Planes. All kinds of Hoisting Machinery a Specialty.

BLAST FURNACE HOISTING ENGINES,

With Vertical or Horizontal Cylinders, for Handling Stock to Top of Stack with One or Two Platforms.
WORKS AND OFFICE, 3001 Chestnut St., Phila. NEW YORK OFFICE, 95 and 97 Liberty St.

E. W. BLISS. PRESSES & DIES.

SHAPERS & SQUARING SHEARS



No. 21 ADJUSTABLE PRESS.

FINE ENGINE LATHES.

SPECIAL MACHINERY FOR TIN & SHEET

METAL WORKERS
PLYMOUTH, PEARL & JOHN ST'S. BROOKLYN, N.Y.

DROP FORGINGS

Of Every Description a Specialty.

ADDRESS

R. H. BROWN & CO.,

NEW HAVEN, CONN.

ALSO MANUFACTURERS OF

W. A. Clark's Patent Expansive Bit,

Clark's Patent Handle Screw Driver,

And Other Specialties in Hardware Line.

ADJUSTABLE "DUPLEX" DIE STOCK, FOR PIPE AND BOLT.



NO NEED WORKING WITH DULL TOOLS. ONLY DIE STOCK WITH ADJUSTABLE SELF-CENTERING GUIDES.

SEND FOR CIRCULAR AND PRICES.

HART MFG. CO., 990 Payne Ave., Cleveland, Ohio.

OUR GOODS ARE SOLD BY THE LEADING JOBBERS IN ALL THE PRINCIPAL CITIES.



TRADE MARK



COVERT'S PATENT HARNESS SNAPS,

Chain and Rope Goods, Adjustable Soldering Irons, &c.

These Goods are sold by all Leading Jobbers in General and Saddlery Hardware at Manufacturers' Prices. Send for Illustrated Catalogue and Price List.

COVERT MANFG. CO., West Troy, N. Y.

GLENN'S VALVE MANUFACTORY.

PATENT BALANCED
HYDRAULIC AND
STEAM VALVES.

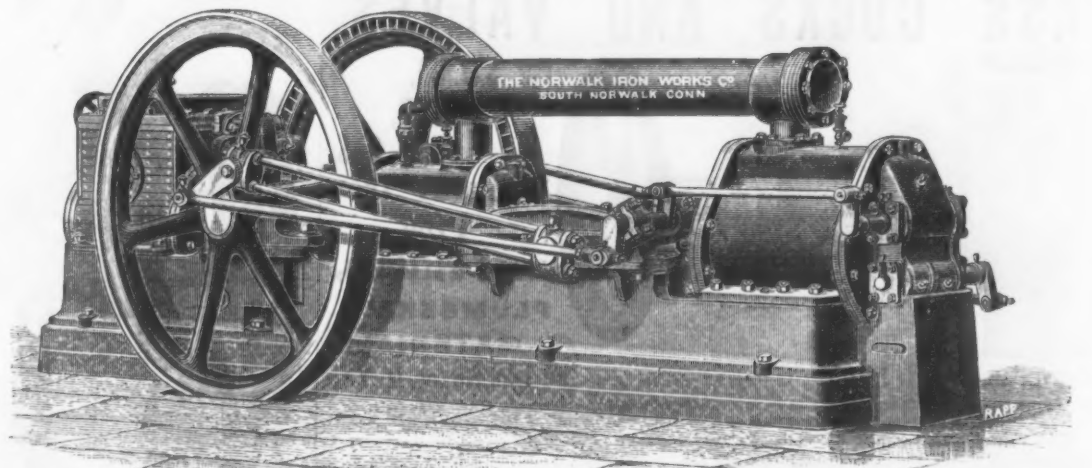


J. S. GLENN, Proprietor.

OFFICE:

115 Fremont Street,
CHICAGO.

Air Compressors.



THE NORWALK IRON WORKS CO., South Norwalk Conn.

WALKER MFG. CO.



SHAFTING,
HANGERS,
PULLEYS.

Pulley Castings and Machine-Molded

GEARING

A SPECIALTY.

Cleveland, - Ohio.

Estimates furnished. Write for Gear and Price Lists A.



Ludlow Valve Mfg. Co.

OFFICE AND WORKS:

938 to 954 River St. & 67 to 83 Vall Ave., Troy, N. Y.

VALVES.

Double and Single Gate, 1/4 in. to 48 in.—outside and inside Screws, Indicator, &c. for Gas, Water, Steam and Oil. Yard and Wash Hydrants. Send for Circular.

Also FIRE HYDRANTS.

MORSE TWIST DRILL AND MACHINE CO.

NEW BEDFORD, MASS., Sole Manufacturers of

Morse Patent Straight-Lip Increase Twist Drill,
Beach's Patent Self-Centering Chuck, Solid and Shell Reamers,

BIT STOCK DRILLS,

DRILLS FOR COES, WORCESTER, HUNTER AND OTHER HAND DRILL PRESSES. BEACH'S PATENT SELF-CENTERING CHUCKS, CENTER AND ADJUSTABLE DRILL CHUCKS, SOLID AND SHELL REAMERS DRILL GRINDING MACHINES. TAPER REAMERS, MILLING CUTTERS AND SPECIAL TOOLS TO ORDER.

All Tools exact to Whitworth Standard Gauges.

GEO. H. STETSON, Supt.

EDWARD S. TARRER, Treas.



MANNING, MAXWELL & MOORE,

Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S

Manufacture of Patent Machine Relieved Nut, Hand, Blacksmith and Machine Screw Taps, Screw Plates, Tap Wrenches and Patent Relieved Pipe Taps and Pipe Dies. Furnished in V. U. S. Standard and Whitworth shape of threads.



111 Liberty Street

NEW YORK.

NIAGARA STAMPING & TOOL CO.,

147 AND 149 ELM STREET, BUFFALO, N. Y.

Manufacturers of Presses, Dies and Tools for Working Sheet Metal, &c. Squaring and Circle Shears and Tinner's Machines and Tools a Specialty.



TINNERS AND OTHERS—WE OFFER YOU THE BEST SNIPS EVER MADE. WE MAKE FOUR SIZES.

No.	2	4	6	8
Cut.....	1/4	3/8	1/2	3/4
Weight.....	1 lb.	2 lbs.	3 lbs.	4 lbs.
Price.....	\$1.00	\$1.50	\$2.00	\$2.50
Postage.....	25 cents	35 cents	45 cents	55 cents

We cannot send the Snips C. O. D. It will cost 25 cents for return charges. Send your money by Postal Order, Express Money Order, or 1 and 2 cent Postage Stamp.

THE UPSON NUT CO.

MANUFACTURERS OF

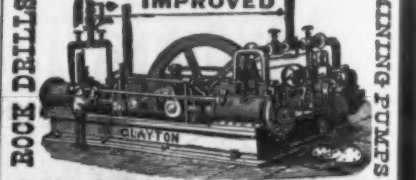
Bolts, Nuts, Washers,
CARRIAGE HARDWARE, &c.

SEND FOR PRICE LIST.

Warehouses: 99 Chambers St., New York.
232 Lake St., Chicago.

Factories: Unionville, Conn.
Cleveland, Ohio.

"CLAYTON" IMPROVED



AIR COMPRESSORS

For CATALOGUE, ESTIMATES, and Address
CLAYTON STEAM PUMP WORKS
45 & 47 York St., BROOKLYN, N.Y.
(Near Approach to New York & Brooklyn Bridge)

RIVAL STEAM PUMPS

THE CHEAPEST AND THE BEST FOR HOT & COLD WATER. \$35.00 UPWARDS. JOHN H. MCGOWAN & CO. CINCINNATI

DEAD-STROKE POWER HAMMERS.



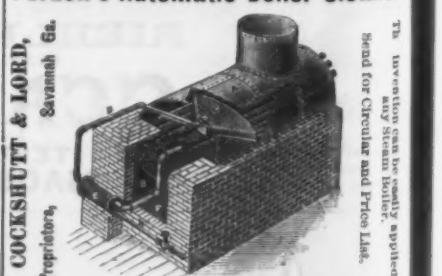
DIEBELT & EISENHARDT, MAKERS,
1310 Howard St., Philadelphia.



A. H. MERRIMAN, Meriden, Conn., Manufacturer of all Descriptions of PRESSES. Catalogue and prices sent on application.

Reduce your Expense of Fuel and Increase the Capacity of your Boiler by Using

Fordon's Automatic Boiler Cleaner



UPRIGHT DRILL CUT-OFF TOOLS DRILL GAUGES

Machinery, &c.

LYON'S HAND OR POWER PUNCHES AND SHEARS.



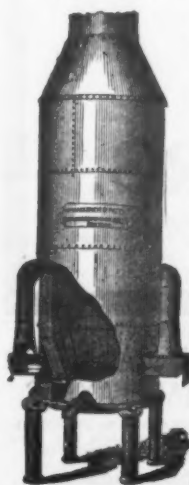
For Round, Flat or Square Iron.
Polishing & Buffing Machinery,
HYDRAULIC JACKS

To raise from 4 to 150 tons.
Hydraulic Presses for Special & General Use.
HYDRAULIC HAND & POWER PUMPS,
1 to 6 plungers, for uniform or changeable speed.

WATSON & STILLMAN
(Successors to E. LYON & CO.),
470 B Grand Street, NEW YORK.
Send for circular of what you want.

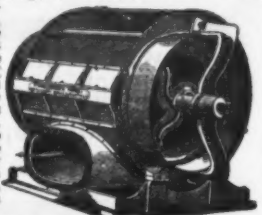


**THE MACKENZIE PATENT
CUPOLA & BLOWER.**



Send for circular to
Smith & Savre Mfg. Co.,
PROPRIETORS, 245 Broadway, New York.

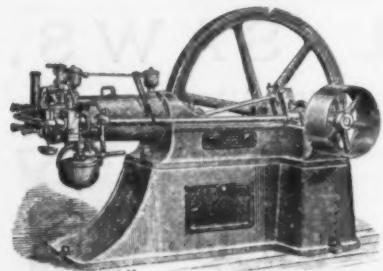
This Cupola has made a great revolution in melting iron. It differs from all others in having a continuous tapers, or in other words, the blast enters the furnace at all points. Above one ton capacity per hour, they are made oval in form. This brings the blast to the center of the furnace with the least resistance and enables it to produce a great amount of power, and in combination with the continuous tapers causes complete diffusion of the air throughout the furnace, and uniform temperature, melting ten or fifteen tons an hour with the pressure of blast required to melt two or three tons in an ordinary Cupola. It also enables us to save very largely in time and fuel, the experience of our customers showing a gain of twenty-five to fifty per cent. in time, and twenty-five to forty per cent. fuel over the ordinary Cupola, and a better quality of casting, especially in light work. This is due to the thorough diffusion of the air and more perfect combustion, extracting less carbon from the iron, making a softer and tougher casting. We manufacture these Cupolas of any desired capacity, numbered from 1 to 20, inclusive, the numbers denoting the melting capacities in tons per hour—No. 1, one ton; No. 2, two tons; No. 3, three tons per hour, and so on up to 20, or 25 tons. We have improved the construction of these Cupolas in every way, have increased their strength and durability, and sought to make them as convenient for working and repairs as our own and the experience of our customers could suggest.



"OTTO" GAS ENGINE.

OVER 14,000 IN USE.

20 to 70 per Cent. Less Gas Consumption per Brake Horse-power Than Any Other Engine.



TWIN ENGINES.
One Impulse Every Revolution
ENGINES AND PUMPS COMBINED.
For Hydraulic Elevators, Town Water Supply and Railway Services.
1 TO 25 IND HORSE-POWER.
SCHLEICHER, SCHUMM & CO.,
N. E. Cor. 33d & Walnut Sts., Philadelphia.
214 Randolph St., Chicago.

STEPHEN A. MORSE.

C. M. WILLIAMS.

EDWIN F. MORSE.

SEND FOR CIRCULARS. **CLEM & MORSE,** LATEST PATENTED IMPROVEMENTS.
Manufacturers and Builders of

ELEVATORS

Hoisting Machinery, Automatic Hatch Doors, &c.

413 Cherry St., PHILADELPHIA, PA. Branch Office, 108 Liberty St., NEW YORK

BAGNALL & LOUD,

BOSTON, MASS.

Clasp closed.

METALINE
AND
Improved Sleeve Roller
Bush Tackle Blocks.

Also a full line of every variety of
TACKLE BLOCKS.
Try Us with a Sample Order.
Send for Illustrated Catalogue.
New York Warehouse, 33 South Street.

Western Agency: C. H. GURNEY & CO., 247 Lake St., CHICAGO.



SOLE AGENT
IN THE UNITED STATES FOR
J. MONCRIEFF'S
CELEBRATED
Scotch Gauge Glasses



IRON ROOFING.

Extra quality. Best plan in use. (Sold as low as any other.)

MANUFACTURED BY
T. C. SNYDER & CO., Canton, Ohio

Cheap, strong and durable. Does not get out of repair. Every roof sold in even years satisfactory. Any mechanic can apply it. Circular and sample free. Also manufacturers of the best and cheapest Metallic Paint in use.



First-Class, Heavy, Double & Treble Geared Engine Lathes,
Horizontal Boring Lathes, For Lathes, Lifting Jacks and Cornice Machinery.

GEORGE A. OHL & CO., East Newark, N. J.

DRILL PRESSES.



New Upright Power
Drill Presses. No. 4
swings 21 inches; back-
geared, quick return.
A strong iron brace
extends from base to head
of column—a new feature.
Weight, 1100 lbs.;
height, 6 feet. Price,
\$210.
No. 1 size, to set on
bench, swings 17 inches,
lever feed, 3 speeds,
tight and loose pulleys.
Price, \$95.
Peerless Punch & Shear Co.,
38 W. Day Street, New York.

PUNCHING & SHEARING PRESSES.



Power, Foot or
Hand
PUNCHES
AND
SHEARS.
All sizes, from \$25 to \$3000.
DRILL PRESSES, LATHES,
SHEARS, BOILER ROLLS,
STEAM HAMMERS; ALL
SIZES: LOW PRICES.
Peerless Punch & Shear Co.,
38 W. Day St., New York.

Machinery, &c.

William Sellers & Co.,

ENGINEERS,

PHILADELPHIA,

MAKERS OF

MACHINE TOOLS

FOR WORKING IRON AND STEEL.

Steam Hammers; Riveting, Bending and Plate
Planing Machines; Punches and Shears; Lathes; Drilling,
Boring, Slotting, Shaping and Planing Machines, &c., &c.

Improved System of Shafting for Transmitting Power.

Specifications, Photographs and Prices Furnished
on Application.

BRANCH OFFICES:

79 Liberty Street, New York City,
Colorado Springs, Colorado.

THE PUSEY & JONES COMPANY,

WILMINGTON, DELAWARE,

BUILDERS OF

STEAM ENGINES.

Boilers, Tanks,

MACHINERY FOR ROLL-
ING MILLS,

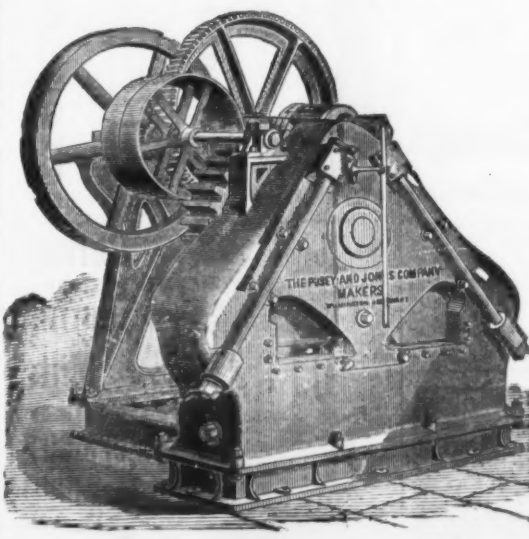
Punches, Shears,

Machines for Cutting off and
Sitting old Railroad Rails pre-
vious to being piled in Rolling
Mills.

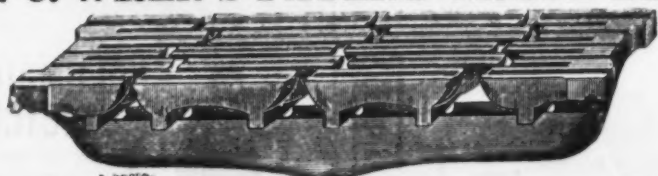
Steam Riveting Machines,
Applicable to Bridge Builders'
Work.

RIGHT AND LEFT ANGLE
IRON CUTTERS,

Hydraulic Bending
Machines,
AND HEAVY MACHINERY
GENERALLY.



W. C. WREN'S PATENT GRATE BAR.



DAVID S. CRESWELL,

MANUFACTURER,

816 Race Street, - - - - Philadelphia, Pa.

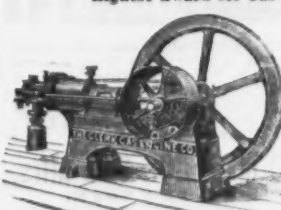
The Most Durable Grate Bar on the Market. Send for circular and price list.

BOILERS

BOILERS REPAIRED, ENLARGED,
STATIONARY OR PORTABLE.
IMMEDIATE DELIVERY.
CORRESPONDENCE SOLICITED.
HARRISON SAFETY BOILER WORKS.
BERMUDOWN, LONG BRIDGE, PHILA. PENNA.
GENERAL AGENTS:
SHEDDEN & BENTLEY
381 PARK PLACE, NEW YORK.

THE CLERK GAS ENGINE.

Highest Award for Gas Engines at American Institute Fair, New York, 1883.



Makes an ignition at every revolution of the Fly Wheel. Is started with ease, and gives full power immediately. No danger from fire; no extra insurance nor skilled engineer required. Runs perfectly steady; only uses gas when required. Workmanship of the best description and guaranteed. Indicated power considerably larger than in any other Gas Engine of the same size, each Engine giving from 1 H.P. to 4 H.P. more than named. Is unsurpassed by any other Gas Engine for running any kind of machinery or electric light, arc or incandescent. Has means for regulating to suit any coal or water gas.

No Bell r. Coal, Ashes or Engineer. Made in Sizes of 4, 8, 10, 15 and 25 H.P.

THE CLERK GAS ENGINE CO., 1012-1016 Filbert St., Philadelphia.

Branch Offices: 142 Chambers St., New York; 4 West 14th St., New York; 76 Dearborn St., Chicago.



Established 1867.

E. Harrington, Son & Co.,

Works and Office,

Cor. N. 15th St. & Penn. Ave.,

PHILADELPHIA, PA., U. S. A.,

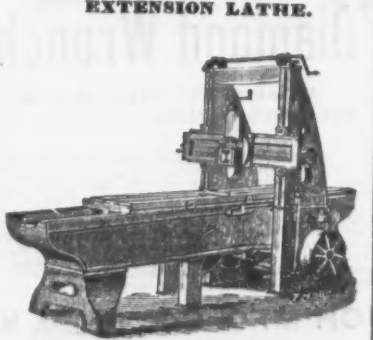
Manufacturers of

**Patent Extension
LATHES,**

Iron Planers,
BORING MILLS

DRILLS,
And a variety of other
Machinists' Tools.

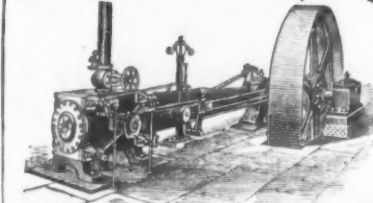
Patent Double Chain Screw
Pulley Blocks, unrivaled for du-
rability, safety and power.
Patent Double Chain Quick-
Lift Hoists, with brake for quick
and easy lowering.
Circulars furnished.



IRON PLANER.

Machinery, &c.

CORLISS ENGINE BUILDERS
"ECONOMY & DURABILITY"



MACHINISTS IRON FOUNDERS
BOILER MAKERS
ROBT WETHERILL & CO.
CHESTER, PA.

STOW FLEXIBLE SHAFT CO., Limited,

15th & Pennsylvania Ave.,

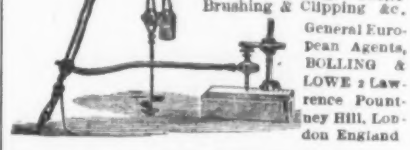
PHILADELPHIA, PA.,

Manufacturers of

Portable Drilling, Tap-
ping, Reaming and
Boring Machines.

Also, Tools for Emery
Wheel Grinding, Metal &
Wood Polishing, Cattle
Brushing & Clipping &c.

General Euro-
pean Agents,
BOLLING &
LOWE 2 Law-
rence Point-
ney Hill, Lon-
don England



PHILA. SHAFTING WORKS.

GEO. V. CRESSON,

18th & Hamilton St.,

PHILADELPHIA.

**SHAFTING
A SPECIALTY**

Manufacturers of

Shafting, Pulleys and

Hangers, Couplings

and every appur-
tenance used in the
TRANSMISSION OF
STEAM POWER.

E. E. GARVIN & CO.,

Machinists and Manufacturers of

Milling Machines, Drill Presses,

HAND LATHES, TAPPING MACHINES,

CUTTER GRINDERS & WOOD PLANERS

Milling Cutters, all
Shapes and Sizes.

Gear Cutting and Mill-
ing in all its branches.

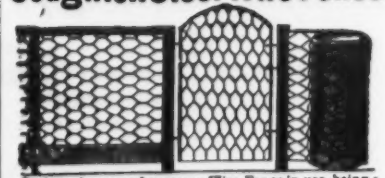
Index Plates Drilled
Accurately. Special

Tools and Machinery
Designed and Built to
Order.



Power Milling Machine.
141 Centre St. New York. Send for Illustrated Catalogue.

Sedgwick Steel Wire Fence



Is the only general purpose Wire Fence in use, being a
Strong Net-Work Without Barbs. It will turn dogs, pigs,
sheep, and poultry, as well as the most vicious stock,
without injury to either fence or stock. It is just the fence
for farms, gardens, stock ranges and railroads, and very
useful for lawns, parks, school lots and cemeteries. Covered
with rust-proof paint (or galvanized) it will last a lifetime.
It is superior to Boards or Barbed Wire in every respect.
We ask for it a fair trial, knowing it will wear itself
into favor. The Sedgwick Gates, made of wrought-
iron pipe and steel wire, defy all competition in neatness,
strength and durability. We also make the best and
cheapest All Iron Automatic or Self-Opening Gate, also
Cheapest and Neatest All Iron Fence. Best Wire
Stretchers and Post Augers. Also manufac-
ture Russell's excellent Wind Engines for
pumping water, or geared engines for grinding
and other light work. For prices and particulars ask
hardware dealers, or address, mentioning name,
SEDGWICK BROS. M'rs., Richmond Ind.

**THE "AUTOMATIC"
BLIND AWWING FIXTURE**
FOR OLD OR
NEW BLINDS



MAKING BLINDS
AWNINGS
AT WILL.
F. O. NORTH & CO.
SOLE MANUFACTURERS
BOSTON.



WE CHALLENGE THE WORLD FOR ITS EQUAL.

The cheapest, most durable and effective tool for
Cleaning Tubes Hot or Cold.

RUFFNER & DUNN, Schuylkill Falls, Philadelphia, Pa.

Patentees and Sole Manufacturers of the EXCELSIOR

STEEL TUBE CLEANERS. Most liberal discount to deal-
ers. Send for Circulars

G. E. BRETTELL,

Water Street, Rochester, N. Y.

Improved Planers a Specialty: 20 X 30, 22 X 22, 24 X 2

26 X 26, 30 X 30, 36 X 36, to plane
any desired length. Send for
Description and Prices before
purchasing.



Mention The Iron Age

TUBAL SMELTING WORKS,

760 & 762 Broad Street, PHILADELPHIA.

PAUL S. REEVES,

MANUFACTURER OF

GENUINE BABBITT METAL

AND ALL GRADES OF

ANTI-FRICTION METALS.

ESTABLISHED:
Spring Making, 1842. Steel Making, 1845. Norway Iron, 1871 (Re-Rolled).

WM. & HARVEY ROWLAND,
MANUFACTURERS OF
Springs, Steel, Re-Rolled Norway
Iron & Slit Norway Nail Rods.
ADDRESS:
FRANKFORD P. O., PHILADELPHIA.

STEEL CASTINGS
FROM 1-4 TO 15,000 LBS. WEIGHT,
True to pattern, sound and solid, of unequalled strength, toughness
and durability. An invaluable substitute for forging, or for cast iron
requiring threefold strength. Gearing of all kinds, shafts, Dies, Ham-
mer-heads, Crossheads for Locomotives, &c. 20,000 Crank-Shafts and
15,000 Gear Wheels of this Steel now running prove its superiority
over other Steel Castings. CRANK-SHAFTS, CROSSHEADS AND
GEARING SPECIALTIES. Steel Castings of every description.
Please send for our Circulars and Prices. Address:

CHESTER STEEL CASTINGS CO.,
Works, Chester, Pa. 407 Library St., Philadelphia.

PITTSBURGH STEEL CASTING CO.,
26TH AND RAILROAD STS., PITTSBURGH, PA.

MANUFACTURERS OF
Refined Bessemer Steel; Improved Steel Castings
UNDER HAINSWORTH'S PATENTS.

We are now prepared to fill orders for refined **BESSEMER BILLETS or BLOOMS** of
any desired carbon and a uniform quality.
We would call attention of consumers to the fact that we use good material, and produce a steel
pronounced by competent judges equal to the best English or German spring and soft steels.
Having had twelve years' experience in the making of **STEEL CASTINGS**, we are able to
refer to our customers in all parts of the United States and Canada as to the quality of our work in
this line. We make castings of steel practically free from blow holes, as soft and easily worked as
wrought iron, yet stiff, strong and durable, with a tensile strength of not less than 65,000 pounds to
the square inch. In short, our castings unite the qualities of steel and wrought iron.
Wheels, Pinions, Cranks, Dies, Hammer Heads, Engines and Machinery Castings of all descrip-
tions, Railroad Frogs and Crossings, Plowshares, Moldboards and Landslides.
Special attention given to Heavy Castings. We use no cast-iron in our Castings. Send for circular.

ROP HAMMERS.
Punching Presses,
DIES AND OTHER TOOLS
FOR THE MANUFACTURE OF ALL KINDS OF
SHEET METAL GOODS,
DROP FORGINGS, &c.
Stiles & Parker Press Co.,
MIDDLETOWN, CONN.

Branch Factory and Office, 59 DUANE STREET, NEW YORK.

STEAMERS' PATENT BARN DOOR HANGER.
Only Hanger made
having a HARDENED
BEARING and the
wheel turned and
finished PERFECTLY
TRUE.
The small friction roll,
as shown in the illus-
tration, prevents any side
friction.
The low price of
Track makes it the
CHEAPEST Hanger in
the market.
PRICE, PER CASE 1 DOZ. Pcs.:
4-inch.....\$12.00
5-inch.....14.40
Track, per ft., 8 cts.
MANUFACTURED BY
**E.C. STEARNS
& CO.,**
SYRACUSE, N. Y.

BRADLEY'S HEATING FORCES.
For Hard Coal or Coke.
INDISPENSABLE IN ALL SHOPS

to keep Bradley's Cushioned Hammers and
men fully employed, and reduces cost of
production.
BRADLEY & COMPANY.
SYRACUSE, N. Y.
(ESTABLISHED 1832.)

PATENTED Nov. 2d, 1880. PATENTED Oct. 16th, 1883.
STEEL FORGED, CASE HARDENED AND HIGHLY POLISHED.

THE Diamond Wrench
Is the BEST WRENCH ever offered for
MECHANICS, FARMERS and GENERAL USE.
Reasons Why.—It is forged from solid Steel, Case Hardened, finely
fitted and highly polished. It adjusts more rapidly and accurately. It
gives the grip of a vise. Therefore it never slips, to the injury of the
hands of the Operator. Nut, Wrench or surrounding machinery. The
Jaws are in perfect parallel line. It can be applied or fastened to the
corners as well as the face of the nut. This allows giving the eighth
turn in corners or difficult places, the same as ordinary wrenches act on octagon nuts.
In removing nuts from carriage, the wrench is set tightly upon the nut, and the hands
are not brought in contact with the black oil. It is a complete hand vise for holding all
articles within its capacity. It is in using the Diamond End, it holds the nut without
slipping. Manufactured by
DIAMOND WRENCH MFG. CO., Portland, Me.

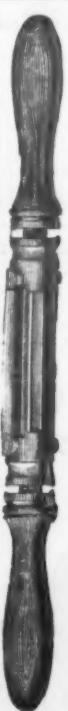
STANLEY G. FLAGG & CO.
PHILADELPHIA PA.

Office and Works,
N. W. cor. 19th St. & Pennsylvania Ave.
MANUFACTURERS OF

STEEL CASTINGS.

A Substitute for Steel & Wrought Forgings.
Circulars sent on application.

STEEL CASTINGS
Railroad and Machine Castings,
15 lb. to 10 tons. Locomotive Cross
Heads and Gearing a Specialty.
Eureka Cast Steel Co.,
307 Walnut St., PHILADELPHIA.



GOODSELL'S SPOKE SHAPE.
The Circular Shape of this Tool enables it to work in a smaller circle than any other
Spoke Shave. The angle of the knife is such that it scrapes the grain
of the wood. Either hand can be removed to work in a ramped blade
is polished and steel-plated; the handles are rosewood; the curved blade of the best
forged steel, making altogether a very beautiful and useful tool.
LIST PRICE, PER DOZEN, \$9.00.
MILLERS FALLS CO.,
74 Chambers Street, New York.

**Boring
AND
Turning
Mills**
48 & 72 IN. SWING.
UPRIGHT
DRILLS
ALL SIZES.
H. BICKFORD,
CINCINNATI,
OHIO.

COLUMBIA BICYCLES.
The Popular Steeds for
Business and Pleasure.
COLUMBIA TRICYCLES.
For Ladies and Gentlemen.
Send Stamp for Illustrated
(32-p.) Catalogue.
The Pope Mfg. Co.
597 Washington St.,
Boston, Mass.
Branch House,
12 Warren St., N. Y. City.
THE BEST IN USE.

**DUC'S
IMPROVED ELEVATOR
BUCKET**

This is the only scientifically constructed bucket
in the market. It is struck out from charcoal
stamping iron (steel). "No corners to catch." "No
seams to burst." "No interior corners to clog
up." It runs with great ease and half the power
of the old-style bucket. Will outwear half a
dozen of them. **Prices Reduced.**

IRON CLAD MFG. CO., Sole Mfrs.,
22 Cliff Street, NEW YORK.

A. G. PECK & CO.,
Cohoes, N. Y.,
MANUFACTURERS OF
**AXES, ADZES,
BROAD AXES,
HATCHETS.**
Send for Catalogue and
Price List.

Scranton Brass and File Works.
J. M. EVERHART,
Manufacturer of
BRASS WORK,
For Water, Gas & Steam.
Exhaust Steam Injector, using waste
Steam only, returning it to Boiler
with water at 150 degrees.
Also, PATENT CUT FILES.
SCRANTON, PA.

RUSSELL, BURDSALL & WARD,
PORTCHESTER, N. Y.,
MANUFACTURERS OF

**CARRIAGE,
TIRE, BOLTS** **PLOW,
STOVE, &c.**

Carriage Bolts made from Best Square Iron a Specialty.

E. A. C. DU PLAINE,
Anti-Friction & Babbitt Metals,
CHICAGO.

XXXX Extra Nickel Babbitt Metal.
XXX Nickel Babbitt Metal.
XX Nickel and Copper Babbitt Metal.
X Genuine Copper Babbitt Metal.
AA Genuine Babbitt Metal.
A Genuine Babbitt (so called by other makers).
B Lubricating Babbitt (almost without friction).
C Adamantine Babbitt (very hard).
No. 1 Hardware Babbitt Metal.
No. 2 Hardware Babbitt Metal.

TIN SOLDERS.

Best 1/2 Tin 1/2 Lead Solder. Warranted. No. 1 Solder. 80 Tin, 100 Lead. Warranted.
Commercial 1/2 and 1/2 Solder. 90 Tin, 100 Lead. Warranted.
Lead. Warranted. No. 2 Plumbers' Solder. 40 Tin, 60 Lead.

WRITE FOR QUOTATIONS BEFORE ORDERING ELSEWHERE.

F. W. WURSTER,
**IRON FOUNDRY
AND AXLE WORKS,**
130 to 149 First St.,
Brooklyn, N. Y.

J. M. CARPENTER
PAWTUCKET, R. I.

MANUFACTURER OF TAPS AND DIES.

SCROLL SAWS,

With or Without Lathe Attachments,
for Foot and Steam Power. The latest and most im-
proved for the workshop or amateur. Prices, \$10
to \$50. New catalogue free. Address

SENECA FALLS MFG. CO.

255 Water St., Seneca Falls, N. Y.

SPECIAL ATTENTION GIVEN TO EXPORT ORDERS.

**SOLID
STEEL
CASTINGS,**

FROM CRUCIBLE and OPEN HEARTH.

HYDRAULIC CYLINDERS AND GEARING SPECIALTIES.

CUN METAL ROLLS, PINIONS and CASTINGS.

AIR-FURNACE REFINED MALLEABLE CASTINGS.

All Stock used by us is subject to Chemical Analysis in our own Laboratory.

ISAAC G. JOHNSON & CO.,

Established 1853. SPUYTEN DUYVIL, NEW YORK CITY.

AMERICAN SPRING HINGES.

JAPANNED,
COPPER BRONZED,
REAL BRONZE
AND
POLISHED BRASS.

Single and Double Acting.

MANUFACTURED BY

VAN WAGONER & WILLIAMS CO.

82 Beekman St., New York.

Send for Catalogue of the
above and other Spring Hinges,
Door Springs, Wire Coat
and Hat Hooks, &c.

